TECHNICAL DRAINAGE STUDY for Golden Valley Ranch Mohave County, AZ Area 2, Phases A & B

Prepared for:

Rhodes Homes Arizona, LLC.

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Kingman, Arizona 86401

Stanley Consultants INC.
A Stanley Group Company
Engineering, Environmental and Construction Services - Worldwide

Technical Drainage Study

For

Area 2, Phases A & B
Golden Valley Ranch
Mohave County, AZ

March 2006
SCI Project # 18449.00.00

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(See Grading Plans this Project

1. GENERAL LOCATION AND DEVELOPMENT DESCRIPTION

1.1. Introduction

This study is submitted as the technical drainage study for the proposed improvement plans of Area 2, Phases A & B of the Golden Valley Ranch residential development located in the Sacramento Valley of Mohave County, Arizona, more specifically on the south side of the Golden Valley Community, near Kingman. Area 2 comprises of approximately 205 acres of the total 5,800 acres of land located in the Golden Valley Ranch.

The purpose of this study is to accompany the storm drainage infrastructure of the proposed development for Area 2, Phase A only. Phase B improvements will be submitted at a later date. Documentation for Phase B is included to provide continuity in the infrastructure improvements.

This study is divided into four separate areas of consideration. They are as follows:

- A general overview of site drainage
- A detailed analysis of the proposed storm drainage infrastructure.
- An analysis of the drainage improvements in the Public Right-of-Way.
- An evaluation of interim facilities serving the site

1.2. Location

The Golden Valley Ranch project site consists of Taxpin Numbers 215-01-048, 215-01-075, 215-01-078, 215-01-079, 215-01-080, 215-01-084, 215-01-085, 215-01-092, & 215-15-005 within Township 20 North, Range 18 West and Township 21 North, and Range 18 West, G&SRM, Mohave County, Arizona (Figure 1 - Vicinity Map and Regional Drainage Scheme).

1.3. FEMA Flood Hazard Zone

Figure 2 is a representation of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Mohave County, AZ, map number 040058 2325C, dated October 20, 2000. Of the 205 acres of Area 1, 42 acres lies in Special Flood Hazard Zone A.

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study (FIS) by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no Base Flood Elevations (BFE's) or depths are shown within this zone. Mandatory flood insurance purchase requirements apply.

2. SITE DESCRIPTION

2.1. Description of Property

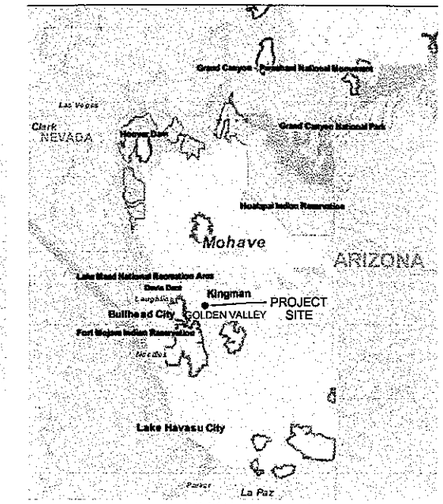
The property is semiarid rangeland with a covering of desert shrub in poor condition. Area 2, Phases A & B is located primarily in the west half of Section 3, Township 20 North, Range 18

LEGEND:
- PROJECT BOUNDARY
- FEMA FLOOD PLAIN
- DRAINAGE SHED BOUNDARY
- DRAINAGE SUB-SHED BOUNDARY

DRAINAGE SHEDS
HM-A = HOLY MOSES WASH - DRAINAGE SHED A
13M-2B = THIRTEEN MILE WASH - TRIBUTARY 2, DRAINAGE SHED B
C-1C = CERBAT WASH - TRIBUTARY 1, DRAINAGE SHED C
J132B1 = JUNCTION THIRTEEN MILE WASH, TRIBUTARY 2, DRAINAGE SHED B, NODE 1

NORTH

GRAPHIC SCALE
(IN FEET)
1 inch = 6000ft.



VICINITY MAP
SCALE: NTS

GOLDEN VALLEY RANCH – WASH FLOW SUMMARY

(100yr., 24 hr PRECIPITATION)

BASIN/NODE	UPSTREAM AREA (Sq. Mi.)	SITED FLOW (CFS)	BASIN/NODE	UPSTREAM AREA (Sq. Mi.)	SITED FLOW (CFS)
HM-A	36.68	12,887	J-A	289.99	18,556
HM-B	11.68	7,668	J-B	136.79	9,862
HM-C	4.53	3,154	J-C	76.07	9,981
HM-D	4.44	2,042	J-D	67.37	8,261
HM-E	3.40	1,197	J-E	51.13	7,303
13M-4	0.25	242	J-F	38.04	6,457
13M-3	12.08	5,177	J-G	60.72	4,141
13M-2A	4.33	3,862	J-H	57.32	14,563
13M-2B	2.41	1,540	J-J	52.88	15,693
13M-2C	3.05	1,304	J-K	48.36	15,344
13M-2D	5.99	1,255	J-L	12.08	5,177
13M-1A	3.87	2,319	J-M	15.78	2,339
13M-1B	3.56	1,255	J-N	9.76	2,746
13M-1C	2.50	660	J-P	7.39	2,101
C2-A	3.31	2,184	J-Q	9.93	1,023
C2-B	6.00	1,687	J-R	7.43	1,321
C2-C	3.78	964	J-S	13.09	1,016
C1-A	7.12	3,913	J-T	9.31	1,690
C1-B	4.18	1,048	J-U	16.24	1,650
C1-C	4.94	1,035	J-V	11.29	2,452
SE-D	1.05	655	J-W	153.19	14,170
			J-X	149.13	14,670
			J-Y	106.13	12,436
			J-Z	80.69	11,890
			J-AA	55.04	9,265
			J-BB	33.50	6,188

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GOLDEN VALLEY SOUTH
VICINITY MAP AND REGIONAL DRAINAGE SCHEME
TECHNICAL DRAINAGE STUDY EXHIBIT

MOHAVE COUNTY ARIZONA FIGURE 1

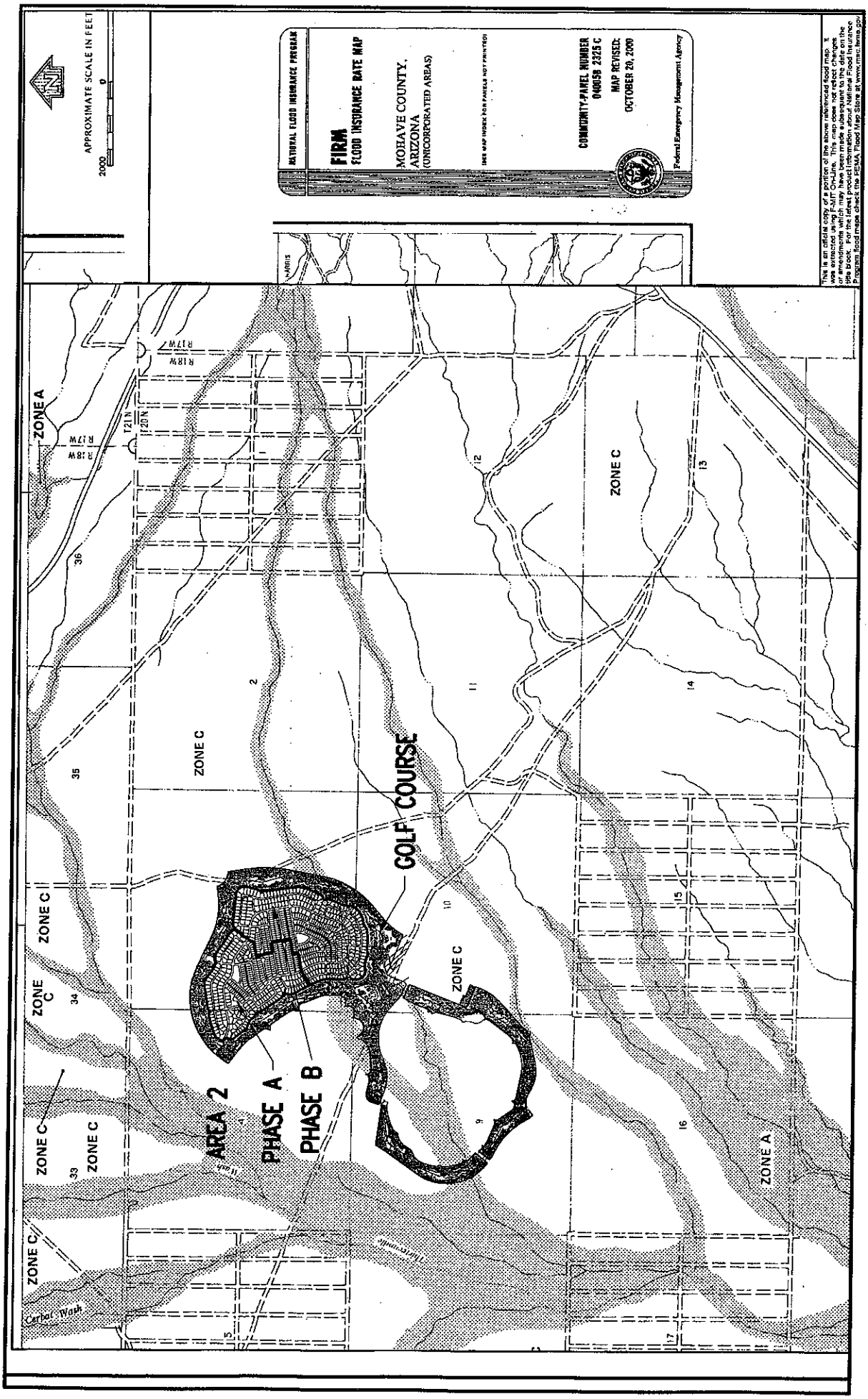


FIGURE 2
AREA 2

West, G&SRM, with minor portions in Sections 2 and 10. The project will be developed into a residential community consisting of single-family (7,000 square feet lots) residences, streets, golf course and open spaces.

2.2. Drainage Descriptions

Area 2, Phases A & B is situated between the Thirteen Miles Wash and the Holy Moses Wash. Small braided channels traverse the site and a diversion channel from the Holy Moses Wash (Diversion Wash 1) crosses in a southwesterly direction across the site. The project lies on westerly sloping alluvial fan originating from the Cerbat Mountains.

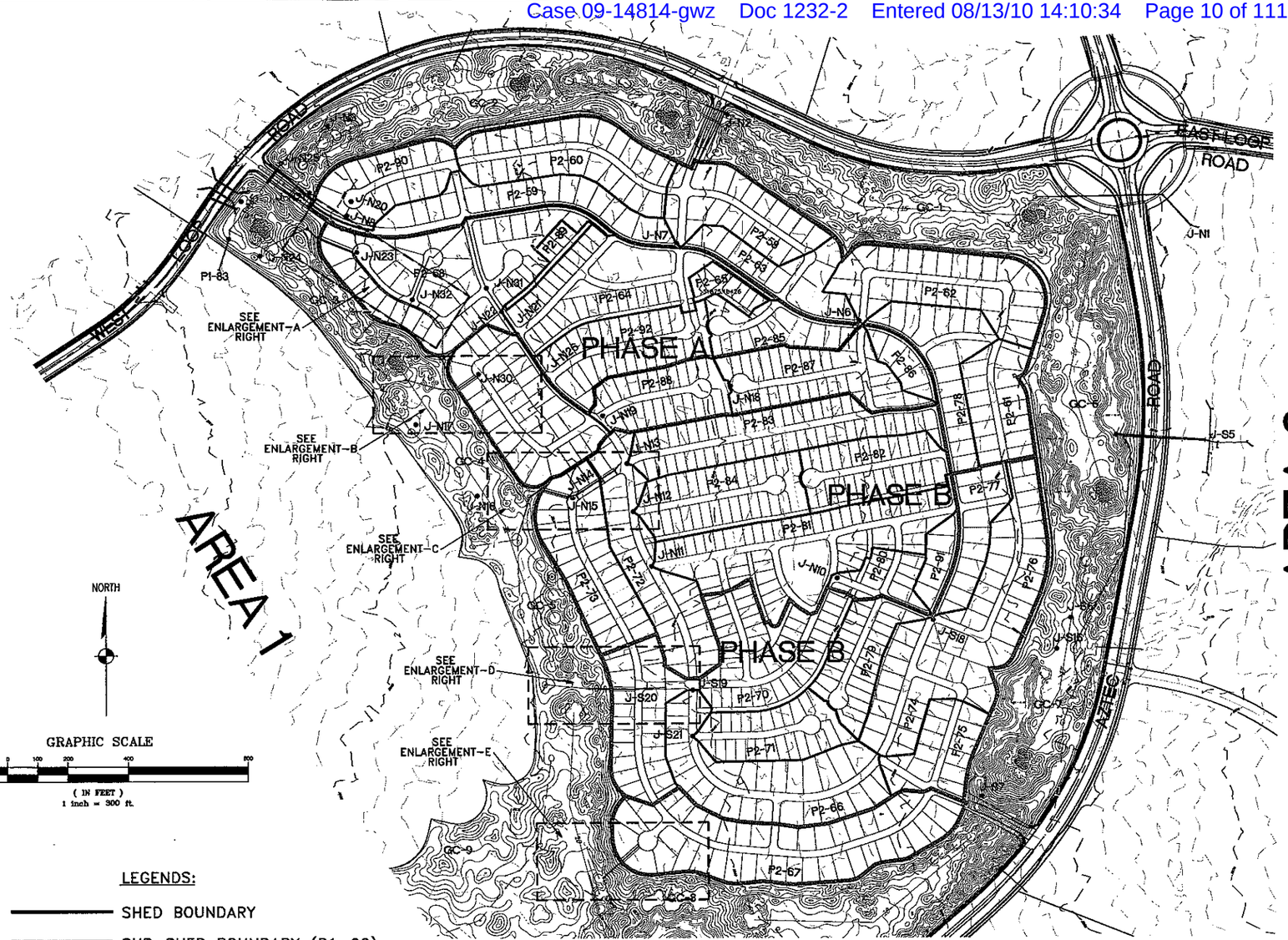
Rainfall runoff generated within the development travels from the individual residential lot or open space to the street. The street is the main mean of runoff conveyance until runoff exceeds the street capacity with an 8 inch depth. When that happens, runoff is received into an underground storm drainage system, into a drainage swale or channel. The storm drainage system is sized to convey a minimum of the 10-yr, 6-hr storm runoff. Runoff generally drains in a westerly direction toward one of six release points. Here, it is received into a storm drainage system and discharged into the golf course. Major runoff travels within the golf courses fairways to be collected and conveyed under the West Loop Road at the Areas southwest corner. It returns to an open channel and discharged into one of the braided washes draining into the Thirteen Mile Wash, a tributary of the Sacramento Wash.

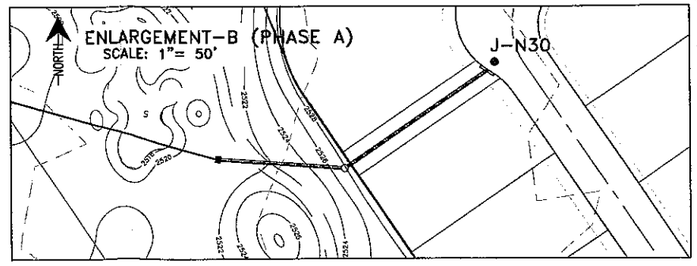
Area 2, Phases A & B is divided into thirty-seven small sub-sheds, ranging in size from approximately 1 acre to 13 acres (See Figure 3). The sunken golf course encompasses the Area 2 development. Shed P2-67 discharges into the south leg of the golf course and travels south away from the site. The remaining 192.38 acres drain west in a westerly direction into the golf course at five points. Four of theses discharge into the west leg of the golf course (between Areas 1 & 2) and flow in a northerly direction to a culvert under the West Loop Road (south of the intersection of West Loop Rd and B2 Street). The other release point drains into the north leg of the golf course (paralleling West Loop Rd.), combining with runoff from Area 3, Shed P3-44 and future Areas 61 and 62. All releases into the golf course are through bubble-up structures with low flow drains tied into the golf course underdrain system. The fairway provides conveyance for major runoff and also storage to retard the peak flow. Runoff exits the golf course via a culvert under the West Loop Road and is conveyed to the Thirteen Mile Wash through an open channel.

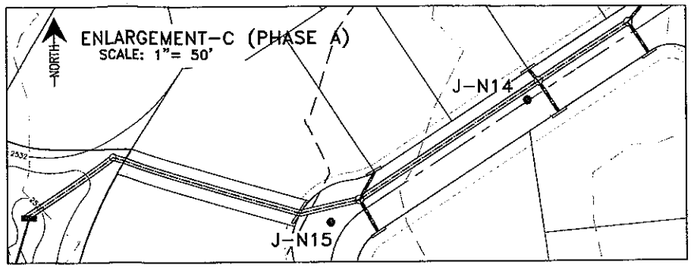
3. METHODS AND CRITERIA

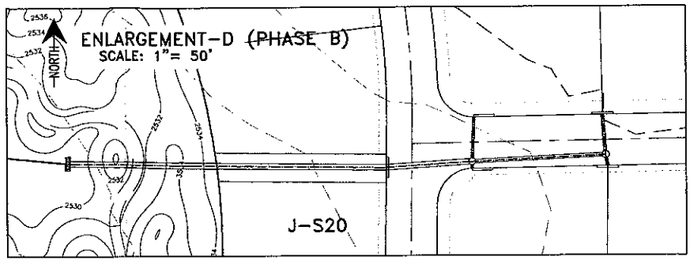
3.1. Methodology

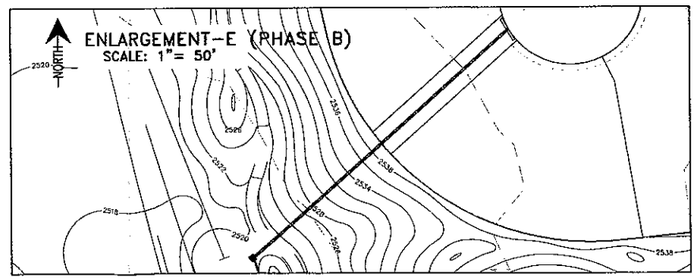
The HEC-HMS model was used for the simulation of flood events in watersheds and river basins. This computer model simulates the surface runoff response of a drainage basin to precipitation by representing the basin as an interconnected system of hydrologic and hydraulic components. Each component models an aspect of the rainfall-runoff process within a portion of

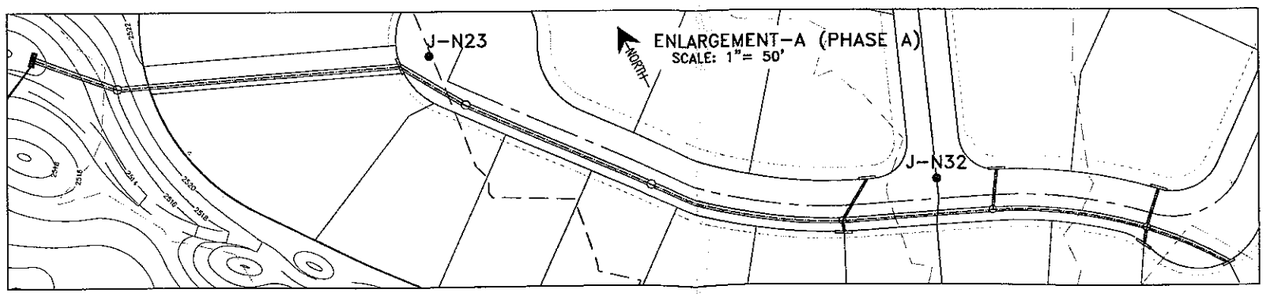












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GOLDEN VALLEY RANCH
AREA 2 DRAINAGE SUB-SHEDS
TECHNICAL DRAINAGE STUDY EXHIBIT

MOHAVE COUNTY ARIZONA FIGURE 3

the whole basin. This basin portion is referred to as a sub-basin. The runoff hydrographs of each sub-basin are then combined and a final discharge hydrograph is obtained. It was chosen as the hydrology model since it is the model used in a Preliminary Federal Insurance Study prepared for Mohave County Flood Control District, October 2005 for various watersheds in the Golden Valley and Kingman, AZ areas. This adds consistency and reliability in the methodology. Modified-Puls routing in the HEC-HMS model allows for retardation of peak flows within the broad flood way of the golf course.

HEC-RAS, another program from the COE, provides a steady state flow analysis to determine water surface elevations within a defined channel or flood plain. Volume computations within the HEC-RAS program were utilized in developing flow routing by Modified-Puls methods.

Water Surface Pressure Gradient (WSPG) program developed by the Los Angeles County Flood Control District. WSPG is a similar program to HEC-RAS in that it develops the water surface elevations and other channel parameters, but is better adapted to closed (pressure) conduit flow and is therefore used in the evaluation of the stormwater infrastructure system.

Calculations for street capacity are produced using the FlowMaster by Haestad Methods, Inc. Inlet calculations are performed using Federal Highway Administration's Visual Urban program for pavement drainage.

3.2. Drainage Shed and Modeling Convention

The basic naming convention of the basins for the exhibits and model are based around the individual drainage shed of the development. Sheds are labeled as P2-34, identifying Area 2, Shed 34. Junction points or points of runoff confluence are identified as J-N12, identifying that it is a junction point and a label. An R designates a routing of a shed or junction, therefore R-JN15 represents routing of junction JN15 to another point.

3.3. Design Storm and Precipitation

Local jurisdiction requires that water sheds less than 20 square miles be evaluated for the 6-hour local storm. Drainage sheds of 20 to 100 square miles are to be evaluated for both the 6-hour and 24-hour rainfall events. Areas from 20 square miles to 500 square miles are considered general storms and are evaluated for the 24-hour precipitation.

Maricopa County Flood Control District has developed storm distribution curves associated with drainage shed size. Since the total area of Area 2, Phases A & B is less than 1 square mile, Pattern 1 of the Maricopa County 6-Hour Mass Curve was utilized for the storm distribution. Precipitation values of 3.00-inches and 1.76-inches were taken from the National Oceanographic and Atmospheric Administration National Weather Service's Atlas 14. Table 1 provides the precipitation values from NOAA Atlas 14. Since the total area of Area 2 is 0.29 square miles (187 acres) the depth-area reduction factor was not applied.

Table 1 - Precipitation

Recurrence Interval (yrs)	5 min	10-min	15-min	30-min	1-hr	2-hr	3-hr	6-hr
10-yr	0.40	0.61	0.75	1.01	1.25	1.44	1.53	1.76
100-yr	0.65	0.98	1.22	1.64	2.03	2.44	2.67	3.00

3.4. Soils

Soils information is taken from the Natural Resources Conservation Service, Soil Data Mart. Soils within Area 1, Phases A & B consist of CACIQUE-BUCKLEBAR-ALKO (AZ039) type. These soils have a hydrologic soil type designation of "C".

3.5. Model Data and Results

Table 2 summarizes runoff at junction points and drainage sheds within Area 2, Phases A & B. Runoff values are rounded to the nearest 1 cfs.

Table 5 –Flow Summary

Element	Area (sq mi)	Peak Discharge 100-yr (cfs)	Peak Discharge 10-yr (cfs)	Element	Area (sq mi)	Peak Discharge 100-yr (cfs)	Peak Discharge 10-yr (cfs)
J-N10	0.0057	11.48	4.06	P2-58	0.0087	16.02	5.78
J-N11	0.0229	43.44	14.9	P2-59	0.0092	15.72	5.55
J-N12	0.0403	77.1	26.86	P2-60	0.0113	20.95	7.58
J-N13	0.0523	99.06	34.19	P2-61	0.0064	10.69	3.79
J-N14	0.0627	116.7	39.96	P2-62	0.0121	21.13	7.51
J-N15	0.0728	135.07	46.15	P2-63	0.0063	11.8	4.29
J-N18	0.0118	22.79	8.09	P2-64	0.0126	23.81	8.7
J-N19	0.0131	24.65	8.74	P2-65	0.0019	4.34	1.62
J-N20	0.0184	33.63	12.1	P2-66	0.0139	23.21	8.24
J-N21	0.0279	54.34	18.32	P2-67	0.0197	51.02	18.82
J-N22	0.0393	75.78	25.74	P2-68	0.0066	12.47	4.56
J-N23	0.0589	111.05	37.37	P2-69	0.009	16.41	5.9
J-N26	0.0134	26.39	9.63	P2-70	0.02	37.66	13.76
J-N27	0.0687	114.34	38.95	P2-71	0.0067	13.51	4.81
J-N30	0.0221	39.52	13.55	P2-72	0.0104	18.09	6.42
J-N31	0.0454	87.5	29.9	P2-73	0.0101	19	6.94
J-N32	0.0523	99.42	33.96	P2-74	0.0092	17.97	6.41
J-N6	0.0261	43.47	14.05	P2-75	0.0059	13.01	4.76
J-N7	0.0411	70.44	23.07	P2-76	0.0109	20.12	7.27
J-N8	0.0503	83.94	28.36	P2-77	0.0051	10.49	3.76
J-S17	0.016	29.75	10.85	P2-78	0.0076	17.06	6.3
J-S18	0.0311	57.82	20.99	P2-79	0.0064	14.34	5.29
J-S19	0.0581	107.35	37.57	P2-80	0.0034	7.27	2.63
J-S20	0.0781	136.47	47.93	P2-81	0.0172	32.11	11.66
J-S21	0.0131	26.89	9.85	P2-82	0.008	17.17	6.22
				P2-83	0.012	22.36	8.12
				P2-84	0.0094	19.77	7.12
				P2-85	0.0052	11.07	4
				P2-86	0.0024	5.19	1.88
				P2-87	0.0094	17.76	6.49
				P2-88	0.0013	2.34	0.84
				P2-89	0.0114	25.59	9.44
				P2-90	0.0071	15.51	5.65
				P2-91	0.0023	4.78	1.71
				P2-92	0.0082	16.62	5.93
				P2-93	0.0061	12.55	4.49
				P2-94	0.0069	15.55	5.75

It should be noted that the precipitation depths of the 100-yr, 6-hr event is 3-inches and that the precipitation depth of the 10-yr, 6-hr storm is 1.53-inches. The 100-yr precipitation is nearly twice for the 10-yr event. For the same events the amount of excess precipitation available for runoff is dependent on the runoff curve number, which is a function of soil type, land use, and antecedent moisture conditions. For this reason a larger portion of the 100-yr precipitation is available for runoff than for the smaller 10-yr storm and the ratio of peak runoff for the 100-yr precipitation to 10-yr precipitations is nearly 3.

All model results and input data are found in the Appendices of this study. They consist of the following:

- Appendix A – Model Results and Data provides the input parameters and results for Area 2, Phases A & B sheds.
- Appendix B – Drainage Infrastructure provides the storm drain inlet calculations open channel flow calculations through utility easements.
- Appendix C – Street Capacity Calculations
- Appendix D – Public Right-of-Way Drainage Improvements

4. Drainage Improvements within the Public Right-of-Way

Access to the project site is via Shinarump Road from the north to the new Aztec Road alignment and West Loop Road. Aztec Road will receive a culvert crossing at the Power line Easement to convey runoff from off-site areas to the Thirteen Mile Wash. The West Loop Road will have a pipe crossing from the Open Space area of Area 2, Phase 1 and convey this and other Area 2, Phases 1 & 2 runoff south, crossing a future portion of the West Loop Road and discharging into the golf course (See Figure 4). Discharge from Area 1, Phases A & B drainage sheds are discussed in Section 2.2 of the Drainage Study of Area 1, Phases A & B.

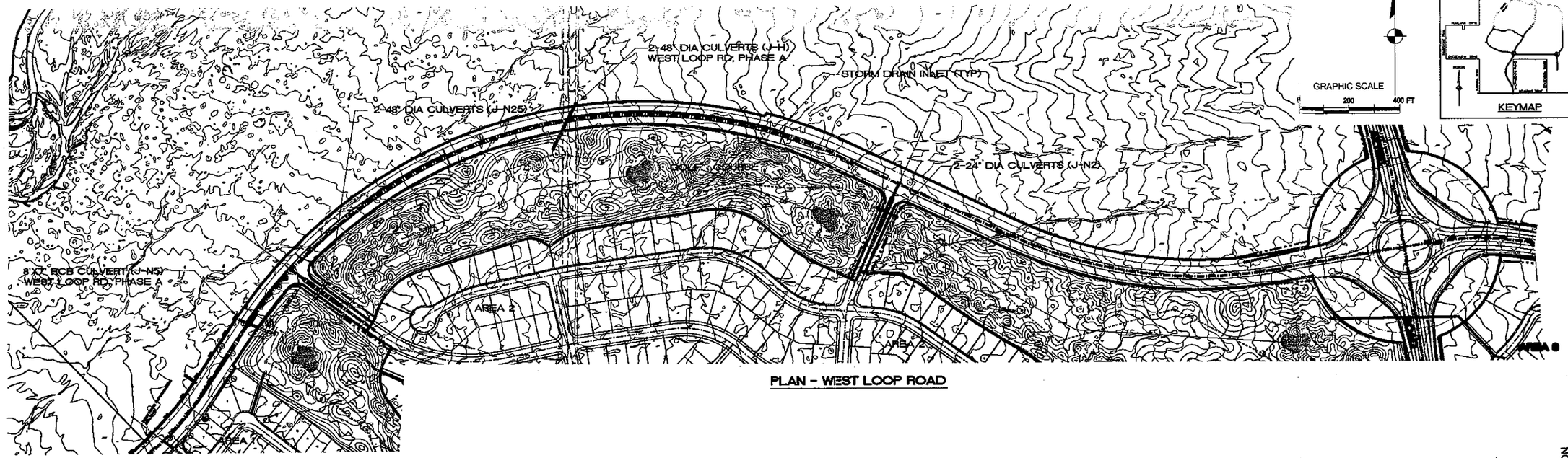
Appendix D contains street capacity calculations for the arterial roads and inlet capacity calculations.

5. Comparison of Flows

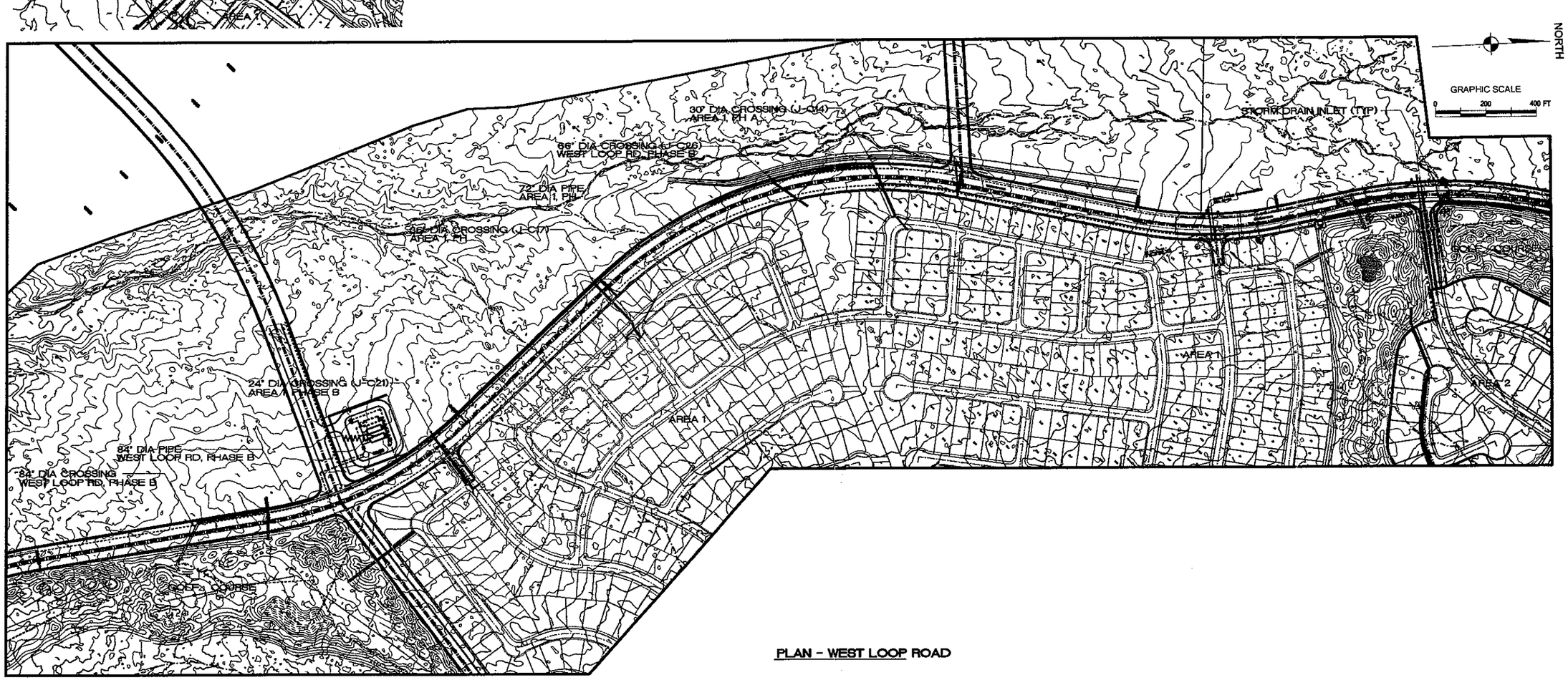
The drainage shed characteristics change with development of existing lands. The pervious soils that formerly existed become less pervious with the addition of houses, streets, and sidewalks and the time for runoff to reach its release point shortens. From a drainage point of view, one of the major advantages to the adjacent golf course is that drainage runoff is routed through its fairway system. This not only allows for runoff of the major storm events, but also allows for the golf course to absorb some for the runoff volume, therefore reducing the peak flow. Figure 5 shows existing drainage as it relates to the Area 1-3 development and outside areas that will drain through the proposed system. Table 3 provides a comparison of existing flows to developed flow at major junction points. Note that runoff from the northern release point J-N5 exceeds its existing flow into the Thirteen Mile Wash, the collective flows from J-N5 and J-S26 less than existing due to detention provided within the golf course.

Table 3 – Flow Comparison

Shed	Area (acres)	Indirect Methods (cfs)	HEC- HMS (cfs)
J-H	73.26	191	211
J3-44	18.12	73	38
J-S5	69.79	184	187
J-S9	439.35	657	456
J-N5	369.78	582	621
J-S26	713.82	916	798



PLAN – WEST LOOP ROAD



PLAN – WEST LOOP ROAD

SCALE (H) 1"=200'
SCALE (V)
DRAWN BY VHD
CHECKED BY MPB
DATE 8/30/05

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GOLDEN VALLEY RANCH

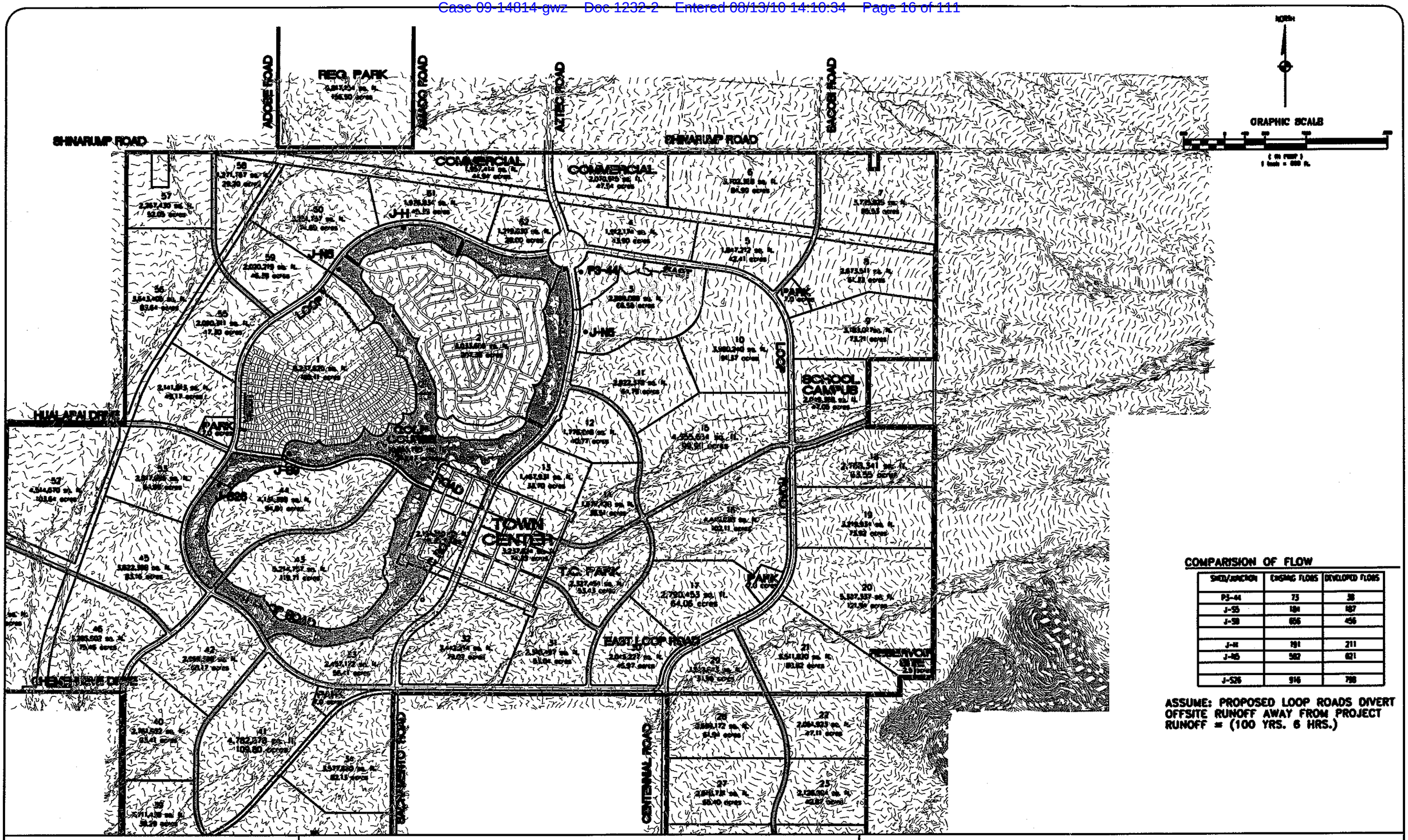
WEST LOOP ROAD
STORM DRAIN IMPROVEMENTS

ARIZONA

M:\RHAME\COMT\

SHEET
FIGURE 4
6 OF 40 SHEETS

SCI PROJECT
18449.03.03



COMPARISION OF FLOW

SHED/JUNCTION	EXISTING FLOWS	DEVELOPED FLOWS
PS-44	73	38
J-S5	191	187
J-S8	856	456
J-H	191	211
J-H5	582	671
J-S6	916	788

ASSUME: PROPOSED LOOP ROADS DIVERT OFFSITE RUNOFF AWAY FROM PROJECT RUNOFF = (100 YRS. 6 HRS.)

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GOLDEN VALLEY RANCH
EXISTING DRAINAGE AND PROPOSED OFFSITE IMPROVEMENTS
TECHNICAL DRAINAGE STUDY EXHIBIT

MOHAVE COUNTY ARIZONA FIGURE 5

6. FEMA Base Flood Elevations

The Holy Moses Diversion Wash #1 leaves the main channel east of the site. It travels in a westerly direction along the westerly sloping alluvial fan. The runoff generally remains within the washes banks, but as it reaches the channel edge it spills over into the surrounding dessert plain. Overtime the cresting and release of flow along with its sediment load has formed a channel with overbanks sloping away from the channel.

A HEC-RAS analysis provides the Base Flood Elevations (BFE) for this diversion wash. The base flood flow within Holy Moses Diversion Wash # 1 is based on derived flow from the Technical Drainage Study for Golden Valley Ranch, Mohave, Arizona, dated October 2005. Finish building grades are developed to remain 1 foot to 1.5 feet above the BFE. Figure 6 shows the BFE's for development in Areas 1-3.

7. SUMMARY

This study develops specific criteria and flow for the development of Area 1, Phases A & B.

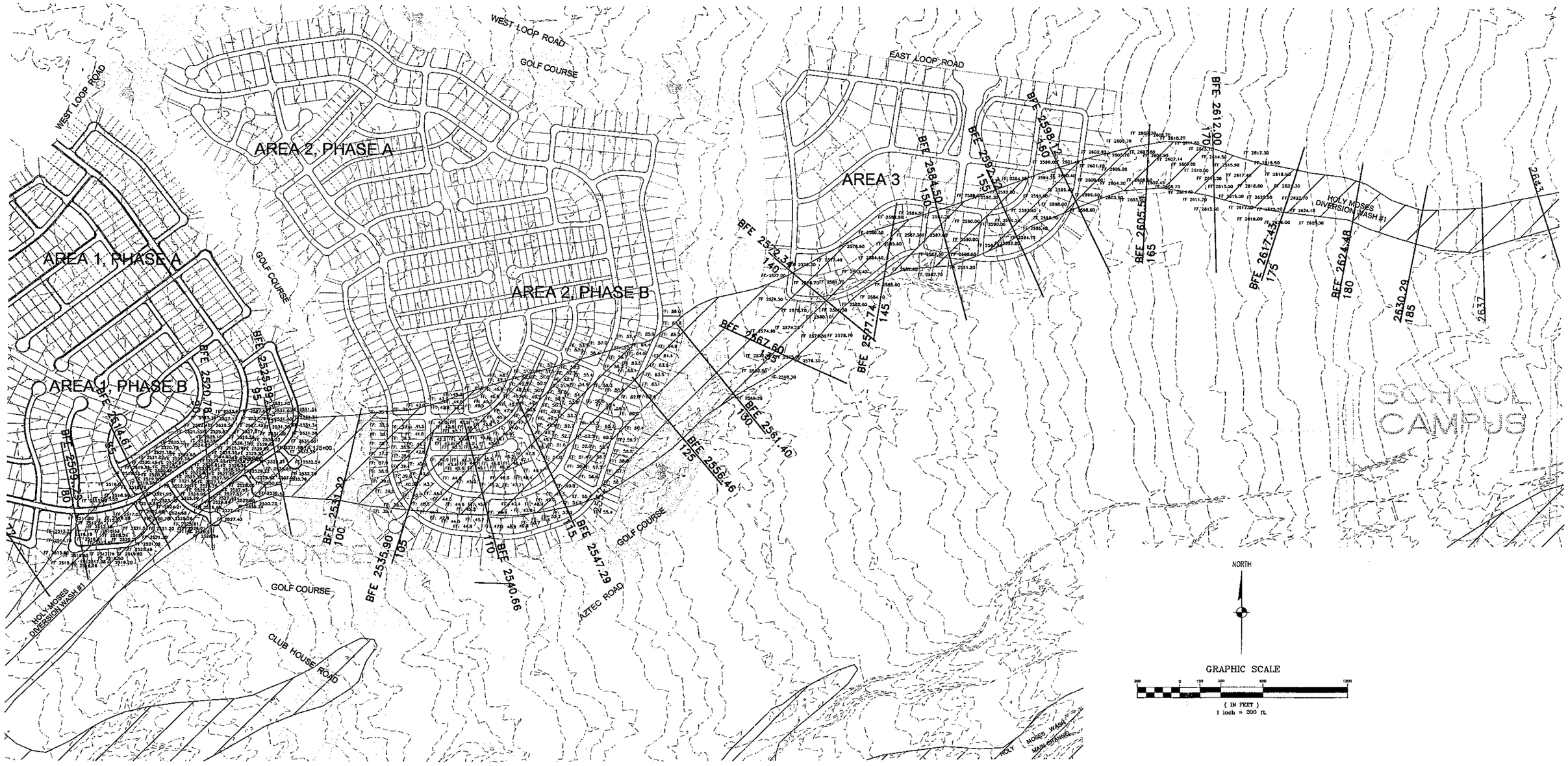
- The majority of the development runoff can be maintained and conveyed within the street right-of-way. Where street flow capacity is reached, a storm drainage system is required.
- The drainage infrastructure is capable of conveying the 10-yr, 6-hr storm event (minimum).
- The adjacent golf course services as runoff conveyance and storage.
- Total discharge from the collective Areas 1-3 to the Thirteen Mile Wash is less because of the use of runoff volume storage provided in the golf course.
- Conveyance of stormwater runoff within the golf course fairways allows for some ground water recharge.

8. REFERENCES

1) *Flood Insurance Rate Map*, Community Panel Number 040058 2325 C, Mohave County, Arizona, effective October 20, 2002.

2) *Highway Drainage Design Manual*, Arizona Department of Transportation, Report Number FHWA-AZ93-281, Final Report, March, 1993

3) *Drainage Design Manual for Maricopa County, Arizona*, Hydrology: Rainfall, Flood Control District of Maricopa County, November 2003



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GOLDEN VALLEY RANCH
HOLY MOSES DIVERSION WASH #1 (BASE FLOOD ELEVATIONS)
TECHNICAL DRAINAGE STUDY EXHIBIT

MOHAVE COUNTY ARIZONA FIGURE 6

APPENDIX A

AREA 2 – RESULTS AND DATA

- HEC-HMS 100-YR, 6-HR SIMULATION
- HEC-HMS 10-YR, 6-HR SIMULATION
- NOAA ATLAS 14 PRECIPITATION
- STANDARD FORM 4

Project: Pod2_S_curve Simulation Run: Pod2-100yr

Start of Run: 01Jan3000, 01:00
End of Run: 02Jan3000, 01:55
Execution Time: 15Mar2006, 10:40:05
Basin Model: POD2
Meteorologic Model: S-Pattern 1(3.00in)
Control Specifications: Control 1

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
J-N10	0.0057	11.48	01Jan3000, 05:10	0.57
J-N11	0.0229	43.44	01Jan3000, 05:15	2.31
J-N12	0.0403	77.10	01Jan3000, 05:15	4.07
J-N13	0.0523	99.06	01Jan3000, 05:15	5.28
J-N14	0.0627	116.70	01Jan3000, 05:15	6.34
J-N15	0.0728	135.07	01Jan3000, 05:15	7.36
J-N18	0.0118	22.79	01Jan3000, 05:15	1.19
J-N19	0.0131	24.65	01Jan3000, 05:15	1.32
J-N20	0.0184	33.63	01Jan3000, 05:15	1.85
J-N21	0.0279	54.34	01Jan3000, 05:15	2.81
J-N22	0.0393	75.78	01Jan3000, 05:10	3.96
J-N23	0.0589	111.05	01Jan3000, 05:15	5.96
J-N26	0.0134	26.39	01Jan3000, 05:10	1.35
J-N27	0.0687	114.34	01Jan3000, 05:15	6.92
J-N30	0.0221	39.52	01Jan3000, 05:15	2.23
J-N31	0.0454	87.50	01Jan3000, 05:10	4.58
J-N32	0.0523	99.42	01Jan3000, 05:10	5.29
J-N6	0.0261	43.47	01Jan3000, 05:15	2.63
J-N7	0.0411	70.44	01Jan3000, 05:15	4.14
J-N8	0.0503	83.94	01Jan3000, 05:20	5.06
J-S17	0.0160	29.75	01Jan3000, 05:15	1.61
J-S18	0.0311	57.82	01Jan3000, 05:15	3.13
J-S19	0.0581	107.35	01Jan3000, 05:15	5.85
J-S20	0.0781	136.47	01Jan3000, 05:15	7.85
J-S21	0.0131	26.89	01Jan3000, 05:10	1.32

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
P2-58	0.0087	16.02	01Jan3000, 05:15	0.88
P2-59	0.0092	15.72	01Jan3000, 05:15	0.93
P2-60	0.0113	20.95	01Jan3000, 05:15	1.14
P2-61	0.0064	10.69	01Jan3000, 05:15	0.64
P2-62	0.0121	21.13	01Jan3000, 05:15	1.22
P2-63	0.0063	11.80	01Jan3000, 05:15	0.63
P2-64	0.0126	23.81	01Jan3000, 05:10	1.27
P2-65	0.0019	4.34	01Jan3000, 05:10	0.19
P2-66	0.0139	23.21	01Jan3000, 05:15	1.40
P2-67	0.0197	51.02	01Jan3000, 05:05	1.99
P2-68	0.0066	12.47	01Jan3000, 05:10	0.67
P2-69	0.0090	16.41	01Jan3000, 05:15	0.91
P2-70	0.0200	37.66	01Jan3000, 05:15	2.02
P2-71	0.0067	13.51	01Jan3000, 05:10	0.68
P2-72	0.0104	18.09	01Jan3000, 05:15	1.05
P2-73	0.0101	19.00	01Jan3000, 05:15	1.02
P2-74	0.0092	17.97	01Jan3000, 05:10	0.93
P2-75	0.0059	13.01	01Jan3000, 05:10	0.59
P2-76	0.0109	20.12	01Jan3000, 05:15	1.10
P2-77	0.0051	10.49	01Jan3000, 05:10	0.51
P2-78	0.0076	17.06	01Jan3000, 05:10	0.77
P2-79	0.0064	14.34	01Jan3000, 05:10	0.64
P2-80	0.0034	7.27	01Jan3000, 05:10	0.34
P2-81	0.0172	32.11	01Jan3000, 05:15	1.73
P2-82	0.0080	17.17	01Jan3000, 05:10	0.81
P2-83	0.0120	22.36	01Jan3000, 05:15	1.21
P2-84	0.0094	19.77	01Jan3000, 05:10	0.95
P2-85	0.0052	11.07	01Jan3000, 05:10	0.52
P2-86	0.0024	5.19	01Jan3000, 05:10	0.24
P2-87	0.0094	17.76	01Jan3000, 05:10	0.95
P2-88	0.0013	2.34	01Jan3000, 05:15	0.13
P2-89	0.0114	25.59	01Jan3000, 05:10	1.15

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
P2-90	0.0071	15.51	01Jan3000, 05:10	0.72
P2-91	0.0023	4.78	01Jan3000, 05:10	0.23
P2-92	0.0082	16.62	01Jan3000, 05:10	0.83
P2-93	0.0061	12.55	01Jan3000, 05:10	0.61
P2-94	0.0069	15.55	01Jan3000, 05:10	0.70
R-JN10	0.0057	11.33	01Jan3000, 05:15	0.57
R-JN11	0.0229	42.95	01Jan3000, 05:15	2.31
R-JN12	0.0403	76.70	01Jan3000, 05:15	4.07
R-JN13	0.0523	98.60	01Jan3000, 05:15	5.29
R-JN14	0.0627	116.07	01Jan3000, 05:15	6.35
R-JN18	0.0118	22.31	01Jan3000, 05:15	1.19
R-JN19	0.0131	23.99	01Jan3000, 05:20	1.32
R-JN21	0.0279	54.14	01Jan3000, 05:15	2.82
R-JN22	0.0393	74.95	01Jan3000, 05:10	3.97
R-JN26	0.0134	26.31	01Jan3000, 05:15	1.35
R-JN31	0.0454	86.20	01Jan3000, 05:15	4.59
R-JN32	0.0523	98.61	01Jan3000, 05:15	5.29
R-JN6	0.0261	42.62	01Jan3000, 05:15	2.63
R-JN7	0.0411	68.85	01Jan3000, 05:20	4.13
R-JN8	0.0503	83.83	01Jan3000, 05:20	5.07
R-JS17	0.0160	29.65	01Jan3000, 05:15	1.61
R-JS18	0.0311	57.72	01Jan3000, 05:15	3.13
R-JS19	0.0581	104.46	01Jan3000, 05:20	5.84
R-JS21	0.0131	26.42	01Jan3000, 05:15	1.32
R-P260	0.0113	20.53	01Jan3000, 05:15	1.14
R-P261	0.0064	10.49	01Jan3000, 05:20	0.65
R-P265	0.0019	4.27	01Jan3000, 05:15	0.19
R-P279	0.0064	13.64	01Jan3000, 05:15	0.64
R-P282	0.0080	16.48	01Jan3000, 05:15	0.81
R-P285	0.0052	10.75	01Jan3000, 05:15	0.52
R-P286	0.0024	5.07	01Jan3000, 05:15	0.24
R-P291	0.0023	4.63	01Jan3000, 05:15	0.23

Project: Pod2_S_curve Simulation Run: Pod2-10yr

Start of Run: 01Jan3000, 01:00
End of Run: 02Jan3000, 01:55
Execution Time: 15Mar2006, 10:40:16
Basin Model: POD2
Meteorologic Model: S-Pattern 1(1.53in)
Control Specifications: Control 1

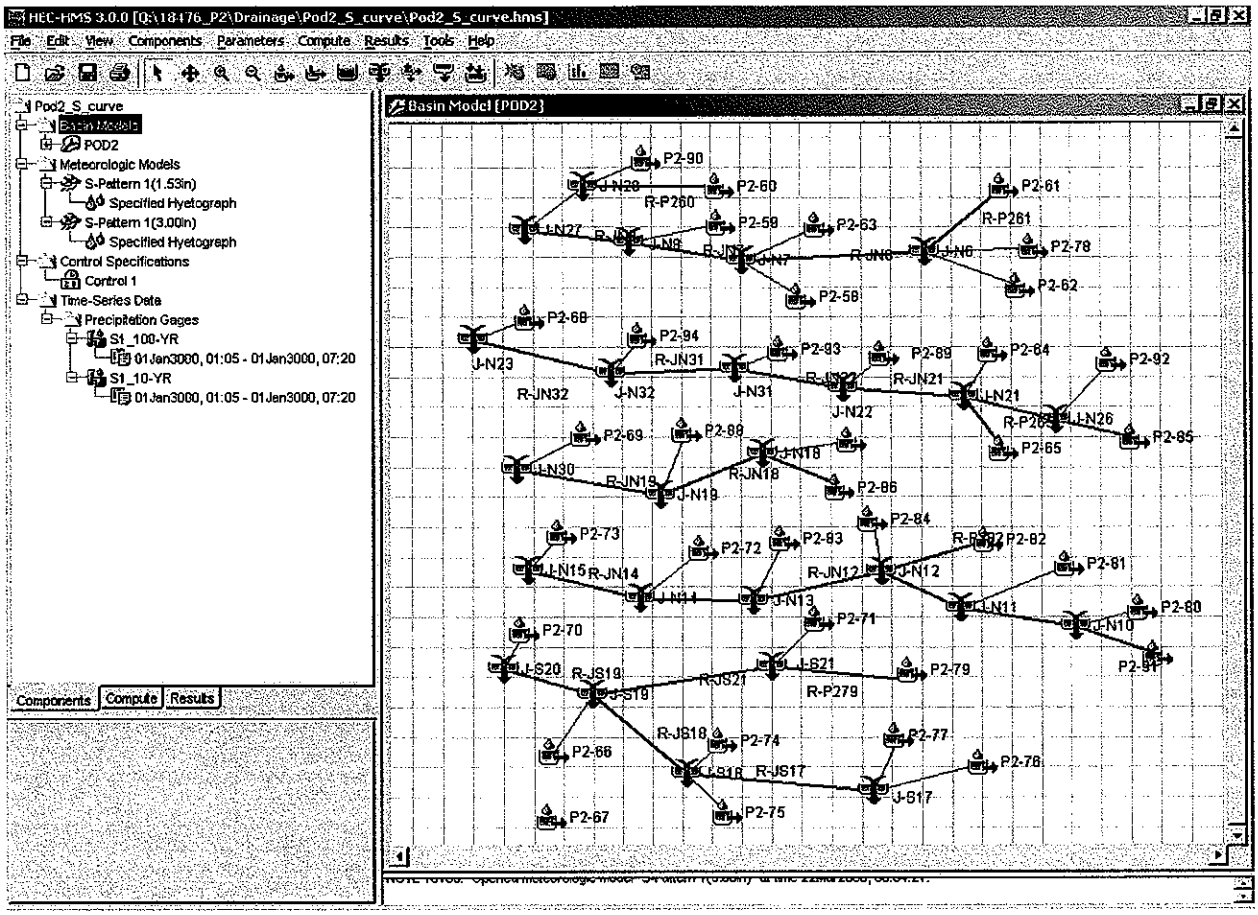
Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
J-N10	0.0057	4.06	01Jan3000, 05:15	0.20
J-N11	0.0229	14.90	01Jan3000, 05:15	0.80
J-N12	0.0403	26.86	01Jan3000, 05:15	1.41
J-N13	0.0523	34.19	01Jan3000, 05:15	1.83
J-N14	0.0627	39.96	01Jan3000, 05:15	2.19
J-N15	0.0728	46.15	01Jan3000, 05:15	2.55
J-N18	0.0118	8.09	01Jan3000, 05:15	0.41
J-N19	0.0131	8.74	01Jan3000, 05:20	0.46
J-N20	0.0184	12.10	01Jan3000, 05:15	0.64
J-N21	0.0279	18.32	01Jan3000, 05:15	0.97
J-N22	0.0393	25.74	01Jan3000, 05:15	1.37
J-N23	0.0589	37.37	01Jan3000, 05:15	2.06
J-N26	0.0134	9.63	01Jan3000, 05:15	0.47
J-N27	0.0687	38.95	01Jan3000, 05:20	2.40
J-N30	0.0221	13.55	01Jan3000, 05:20	0.77
J-N31	0.0454	29.90	01Jan3000, 05:15	1.59
J-N32	0.0523	33.96	01Jan3000, 05:15	1.83
J-N6	0.0261	14.05	01Jan3000, 05:20	0.91
J-N7	0.0411	23.07	01Jan3000, 05:15	1.43
J-N8	0.0503	28.36	01Jan3000, 05:20	1.75
J-S17	0.0160	10.85	01Jan3000, 05:15	0.56
J-S18	0.0311	20.99	01Jan3000, 05:15	1.08
J-S19	0.0581	37.57	01Jan3000, 05:20	2.03
J-S20	0.0781	47.93	01Jan3000, 05:20	2.73
J-S21	0.0131	9.85	01Jan3000, 05:15	0.46

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
P2-58	0.0087	5.78	01Jan3000, 05:15	0.30
P2-59	0.0092	5.55	01Jan3000, 05:15	0.32
P2-60	0.0113	7.58	01Jan3000, 05:15	0.39
P2-61	0.0064	3.79	01Jan3000, 05:20	0.22
P2-62	0.0121	7.51	01Jan3000, 05:15	0.42
P2-63	0.0063	4.29	01Jan3000, 05:15	0.22
P2-64	0.0126	8.70	01Jan3000, 05:15	0.44
P2-65	0.0019	1.62	01Jan3000, 05:10	0.07
P2-66	0.0139	8.24	01Jan3000, 05:20	0.48
P2-67	0.0197	18.82	01Jan3000, 05:05	0.69
P2-68	0.0066	4.56	01Jan3000, 05:15	0.23
P2-69	0.0090	5.90	01Jan3000, 05:15	0.31
P2-70	0.0200	13.76	01Jan3000, 05:15	0.70
P2-71	0.0067	4.81	01Jan3000, 05:10	0.23
P2-72	0.0104	6.42	01Jan3000, 05:15	0.36
P2-73	0.0101	6.94	01Jan3000, 05:15	0.35
P2-74	0.0092	6.41	01Jan3000, 05:15	0.32
P2-75	0.0059	4.76	01Jan3000, 05:10	0.21
P2-76	0.0109	7.27	01Jan3000, 05:15	0.38
P2-77	0.0051	3.76	01Jan3000, 05:10	0.18
P2-78	0.0076	6.30	01Jan3000, 05:10	0.26
P2-79	0.0064	5.29	01Jan3000, 05:10	0.22
P2-80	0.0034	2.63	01Jan3000, 05:10	0.12
P2-81	0.0172	11.66	01Jan3000, 05:15	0.60
P2-82	0.0080	6.22	01Jan3000, 05:10	0.28
P2-83	0.0120	8.12	01Jan3000, 05:15	0.42
P2-84	0.0094	7.12	01Jan3000, 05:10	0.33
P2-85	0.0052	4.00	01Jan3000, 05:10	0.18
P2-86	0.0024	1.88	01Jan3000, 05:10	0.08
P2-87	0.0094	6.49	01Jan3000, 05:15	0.33
P2-88	0.0013	0.84	01Jan3000, 05:15	0.05
P2-89	0.0114	9.44	01Jan3000, 05:10	0.40

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
P2-90	0.0071	5.65	01Jan3000, 05:10	0.25
P2-91	0.0023	1.71	01Jan3000, 05:10	0.08
P2-92	0.0082	5.93	01Jan3000, 05:10	0.29
P2-93	0.0061	4.49	01Jan3000, 05:10	0.21
P2-94	0.0069	5.75	01Jan3000, 05:10	0.24
R-JN10	0.0057	4.01	01Jan3000, 05:20	0.20
R-JN11	0.0229	14.43	01Jan3000, 05:20	0.80
R-JN12	0.0403	26.07	01Jan3000, 05:15	1.41
R-JN13	0.0523	33.53	01Jan3000, 05:15	1.83
R-JN14	0.0627	39.21	01Jan3000, 05:15	2.20
R-JN18	0.0118	7.96	01Jan3000, 05:20	0.41
R-JN19	0.0131	8.36	01Jan3000, 05:25	0.46
R-JN21	0.0279	18.06	01Jan3000, 05:15	0.98
R-JN22	0.0393	25.61	01Jan3000, 05:15	1.37
R-JN26	0.0134	9.14	01Jan3000, 05:15	0.47
R-JN31	0.0454	29.35	01Jan3000, 05:15	1.59
R-JN32	0.0523	32.82	01Jan3000, 05:15	1.83
R-JN6	0.0261	14.01	01Jan3000, 05:20	0.91
R-JN7	0.0411	22.88	01Jan3000, 05:25	1.43
R-JN8	0.0503	28.04	01Jan3000, 05:20	1.76
R-JS17	0.0160	10.51	01Jan3000, 05:15	0.56
R-JS18	0.0311	20.66	01Jan3000, 05:20	1.08
R-JS19	0.0581	36.98	01Jan3000, 05:25	2.03
R-JS21	0.0131	9.64	01Jan3000, 05:15	0.46
R-P260	0.0113	7.28	01Jan3000, 05:20	0.39
R-P261	0.0064	3.77	01Jan3000, 05:25	0.22
R-P265	0.0019	1.56	01Jan3000, 05:20	0.07
R-P279	0.0064	5.15	01Jan3000, 05:15	0.22
R-P282	0.0080	6.11	01Jan3000, 05:15	0.28
R-P285	0.0052	3.87	01Jan3000, 05:15	0.18
R-P286	0.0024	1.80	01Jan3000, 05:20	0.08
R-P291	0.0023	1.68	01Jan3000, 05:15	0.08

GOLDEN VALLEY RANCH



Precipitation

Time	100-yr, 6-hr	10-yr, 6-hr
01Jan3000, 01:05	0	0
01Jan3000, 01:20	0.024	0.012
01Jan3000, 01:35	0.048	0.024
01Jan3000, 01:50	0.075	0.038
01Jan3000, 02:05	0.099	0.05
01Jan3000, 02:20	0.123	0.063
01Jan3000, 02:35	0.15	0.077
01Jan3000, 02:50	0.174	0.089
01Jan3000, 03:05	0.198	0.101
01Jan3000, 03:20	0.222	0.113
01Jan3000, 03:35	0.261	0.133
01Jan3000, 03:50	0.297	0.151
01Jan3000, 04:05	0.354	0.181
01Jan3000, 04:20	0.414	0.211
01Jan3000, 04:35	0.648	0.33
01Jan3000, 04:50	1.131	0.577
01Jan3000, 05:05	2.502	1.276
01Jan3000, 05:20	2.733	1.394
01Jan3000, 05:35	2.793	1.424
01Jan3000, 05:50	2.85	1.454
01Jan3000, 06:05	2.886	1.472
01Jan3000, 06:20	2.916	1.487
01Jan3000, 06:35	2.949	1.504
01Jan3000, 06:50	2.973	1.516
01Jan3000, 07:05	3	1.53

Shed Parameters - Pod 2

DEVELOPED CONDITIONS					
Drainage Shed	Area (ac)	Length (feet)	Elev dn	Elev up	Slope (%)
P2- 58	5.5961	990	2538.8	2546.1	0.737374
P2- 59	5.8944	1580	2523.56	2536.1	0.793671
P2- 60	7.2323	1070	2532.3	2540.8	0.794393
P2- 61	4.1073	1260	2562.1	2565.1	0.238095
P2- 62	7.7728	1270	2549.1	2559.9	0.850394
P2- 63	4.0089	890	2537.6	2546.7	1.022472
P2- 64	8.0819	1210	2528.2	2541	1.057851
P2- 65	1.1909	310	2539.1	2542	0.935484
P2- 66	8.9217	1360	2537.4	2547	0.705882
P2- 67	12.5906	1780	2534.7	2552.2	0.983146
P2- 68	4.2450	1950	2518.5	2532.5	0.717949
P2- 69	5.7293	1060	2526.7	2533.4	0.632075
P2- 70	12.8051	1360	2532	2549.3	1.272059
P2- 71	4.2878	710	2539.5	2547.5	1.126761
P2- 72	6.6392	1300	2531.5	2539.5	0.615385
P2- 73	6.4605	890	2529.5	2537	0.842697
P2- 74	5.8580	810	2550.8	2557.8	0.864198
P2- 75	3.7809	680	2547.4	2557.7	1.514706
P2- 76	6.9868	1230	2552.7	2565.1	1.00813
P2- 77	3.2460	980	2552.9	2565.1	1.244898
P2- 78	4.8944	970	2527.7	2565.1	3.85567
P2- 79	4.0711	760	2544.6	2551.7	0.934211
P2- 80	2.1558	480	2548.5	2552.9	0.916667
P2- 81	11.0348	1470	2538.6	2554.8	1.102041
P2- 82	5.1358	700	2547.1	2555.2	1.157143
P2- 83	7.7059	1790	2533.9	2555.7	1.217877
P2- 84	6.0027	830	2535.1	2548.1	1.566265
P2- 85	3.3268	740	2540.3	2548.5	1.108108
P2- 86	1.5261	460	2550.1	2554.1	0.869565
P2- 87	5.9921	1100	2541.4	2549.1	0.7
P2- 88	0.8086	920	2534.9	2539.9	0.543478
P2- 89	7.2895	470	2527.6	2532	0.93617
P2- 90	4.5258	590	2521.7	2529.8	1.372881
P2- 91	1.4885	400	2553.4	2555.5	0.525
P2- 92	5.2481	810	2532.5	2540.1	0.938272

Project:

6-Hour Design Storm Distribution

Stanley Consultants INC.
5820 S. Eastern Ave. Suite 200
Las Vegas, Nevada 89119
702.369.9396

Project: 0

Job No.: 0
Date: 0
Calculated by: 0

Modified STANDARD FORM 4 from the Clark County Regional Flood Control District's Hydrologic Criteria and Drainage Design Manual

Stanley Consultants INC.
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702.369.9396

					SCS Curve Numbers																								
					Curve Numbers							Sub-Basin Data			Initial/Overland Time (Ti)			Travel Time (Ti)					Tc Check (Urbanized Basins)		Final Tc	TLAG	HEC-INPUT		Remarks
Drainage Basin Name	Drainage Area (Acres)	Drainage Area (Sq. Mi.)	Tol. 602 Para-graph No.	Cover Type and Hydrologic Condition	Curve # for Hydrologic Soils Group A	B	C	D	Composite CN	Designation	K (Default by CN)	Area (Acres)	Length (feet)	Slope (%)	Ti (Min)	Length (feet)	Slope (%)	V1 (FPS) (Manning)	V2 (FPS) (Manning)	Ti (Min)	Total Length (feet)	Tc= (L/180)+10 (Min)	Tc = Ti +Ti (Min)	(Tc*0.6)	Composite CN	Drainage Area (Sq. Mi.)	Tc>=10 for Non Urban Tc>=5 for Urban
										(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(Min)			
DEVELOPED CONDITIONS										DEVELOPED CONDITIONS																	
P2- 58	5.5961	0.0087		7,000 +/- resudebtuak kits	76	84	89	91	89	58	0.78	5.60	170	1.00	7.40	990	0.74	1.73	2.63	7.91	1160	16.4	15.3	9.19	89	0.0087	
P2- 59	5.8944	0.0092		7,000 +/- resudebtuak kits	76	84	89	91	89	59	0.78	5.89	124	1.00	6.32	1580	0.79	1.80	2.73	11.23	1704	19.5	17.6	10.53	89	0.0092	
P2- 60	7.2323	0.0113		7,000 +/- resudebtuak kits	76	84	89	91	89	60	0.78	7.23	149	1.00	6.93	1070	0.79	1.80	2.73	8.11	1219	16.8	15.0	9.02	89	0.0113	
P2- 61	4.1073	0.0064		7,000 +/- resudebtuak kits	76	84	89	91	89	61	0.78	4.11	220	1.00	8.42	1260	0.24	0.99	1.49	16.94	1480	18.2	18.2	10.93	89	0.0064	
P2- 62	7.7728	0.0121		7,000 +/- resudebtuak kits	76	84	89	91	89	62	0.78	7.77	200	1.00	8.02	1270	0.85	1.88	2.82	9.02	1470	18.2	17.0	10.23	89	0.0121	
P2- 63	4.0069	0.0063		7,000 +/- resudebtuak kits	76	84	89	91	89	63	0.78	4.01	210	1.00	8.22	890	1.02	2.04	3.09	6.18	1100	16.1	14.4	8.64	89	0.0063	
P2- 64	8.0819	0.0126		7,000 +/- resudebtuak kits	76	84	89	91	89	64	0.78	8.08	112	1.00	6.00	1210	1.06	2.08	3.15	7.77	1322	17.3	13.8	8.27	89	0.0126	
P2- 65	1.1909	0.0019		7,000 +/- resudebtuak kits	76	84	89	91	89	65	0.78	1.19	110	1.00	5.95	310	0.94	1.95	2.96	2.64	420	12.3	8.6	5.16	89	0.0019	
P2- 66	8.9217	0.0139		7,000 +/- resudebtuak kits	76	84	89	91	89	66	0.78	8.92	183	1.00	7.66	1360	0.71	1.70	2.57	10.49	1543	18.6	16.2	10.00	89	0.0139	
P2- 67	12.5906	0.0197		7,000 +/- resudebtuak kits	76	84	89	91	89	67	0.78	12.59	210	1.00	8.22	1780	0.98	2.00	3.03	11.19	1990	21.1	19.4	11.65	89	0.0197	
P2- 68	4.2450	0.0066		7,000 +/- resudebtuak kits	76	84	89	91	89	68	0.78	4.25	160	1.00	7.18	820	0.79	1.80	2.72	8.60	980	15.4	13.8	8.27	89	0.0066	
P2- 69	5.7293	0.0090		7,000 +/- resudebtuak kits	76	84	89	91	89	69	0.78	5.73	140	1.00	6.71	1060	0.63	1.61	2.43	9.03	1200	16.7	15.7	9.44	89	0.0090	
P2- 70	12.8051	0.0200		7,000 +/- resudebtuak kits	76	84	89	91	89	70	0.78	12.81	120	1.00	6.22	1360	1.27	2.26	3.45	7.81	1480	18.2	14.0	8.42	89	0.0200	
P2- 71	4.2878	0.0067		7,000 +/- resudebtuak kits	76	84	89	91	89	71	0.78	4.29	180	1.00	7.61	710	1.13	2.14	3.25	4.96	890	14.9	12.6	7.55	89	0.0067	
P2- 72	6.6392	0.0104		7,000 +/- resudebtuak kits	76	84	89	91	89	72	0.78	6.64	122	1.00	6.27	1300	0.62	1.58	2.40	10.81	1422	17.9	17.1	10.25	89	0.0104	
P2- 73	6.4605	0.0101		7,000 +/- resudebtuak kits	76	84	89	91	89	73	0.78	6.46	165	1.00	7.29	890	0.84	1.85	2.81	6.81	1055	15.9	14.1	8.46	89	0.0101	
P2- 74	5.8580	0.0092		7,000 +/- resudebtuak kits	76	84	89	91	89	74	0.78	5.86	150	1.00	6.95	810	0.86	1.88	2.84	6.25	960	15.3	13.2	7.92	89	0.0092	
P2- 75	3.7509	0.0059		7,000 +/- resudebtuak kits	76	84	89	91	89	75	0.78	3.76	120	1.00	6.22	680	1.51	2.49	3.77	4.15	800	14.4	10.4	6.22	89	0.0059	
P2- 76	6.9868	0.0109		7,000 +/- resudebtuak kits	76	84	89	91	89	76	0.78	6.99	156	1.00	7.09	1230	1.01	2.03	3.07	8.07	1386	17.7	15.2	9.09	89	0.0109	
P2- 77	3.2460	0.0051		7,000 +/- resudebtuak kits	76	84	89	91	89	77	0.78	3.25	119	1.00	6.19	980	1.24	2.25	3.41	6.04	1099	16.1	12.2	7.34	89	0.0051	
P2- 78	4.8944	0.0076		7,000 +/- resudebtuak kits	76	84	89	91	89	78	0.78	4.89	125	1.00	6.34	970	3.86	3.97	6.01	3.40	1095	16.1	9.7	5.85	89	0.0076	
P2- 79	4.0711	0.0064		7,000 +/- resudebtuak kits	76	84	89	91	89	79	0.78	4.07	52	1.00	4.09	760	0.93	1.95	2.96	5.73	812	14.5	9.8	5.89	89	0.0064	
P2- 80	2.1558	0.0034		7,000 +/- resudebtuak kits	76	84	89	91	89	80	0.78	2.16	160	1.00	7.18	480	0.92	1.93	2.93	4.14	640	13.6	11.3	6.79	89	0.0034	
P2- 81	11.0348	0.0172		7,000 +/- resudebtuak kits	76	84	89	91	89	81	0.78	11.03	100	1.00	5.67	1470	1.10	2.12	3.21	8.96	1570	18.7	14.6	8.78	89	0.0172	
P2- 82	5.1358	0.0080		7,000 +/- resudebtuak kits	76	84	89	91	89	82	0.78	5.14	126	1.00	6.37	700	1.16	2.17	3.29	4.65	826	14.6	11.2	6.73	89	0.0080	
P2- 83	7.7059	0.0120		7,000 +/- resudebtuak kits	76	84	89	91	89	83	0.78	7.71	67	1.00	4.64	1790	1.22	2.23	3.38	10.10	1857	20.3	14.7	8.85	89	0.0120	
P2- 84	6.0027	0.0094		7,000 +/- resudebtuak kits	76	84	89	91	89	84	0.78	6.00	150	1.00	6.95	830	1.57	2.53	3.83	4.73	980	15.4	11.7	7.01	89	0.0094	
P2- 85	3.3288	0.0052		7,000 +/- resudebtuak kits	76	84	89	91	89	85	0.78	3.33	120	1.00	6.22	740	1.11	2.13	3.22	5.16	860	14.8	11.4	6.83	89	0.0052	
P2- 86	1.5261	0.0024		7,000 +/- resudebtuak kits	76	84	89	91	89	86	0.78	1.53	149	1.00	6.93	460	0.87	1.88	2.85	4.07	609	13.4	11.0	6.60	89	0.0024	
P2- 87	5.9921	0.0094		7,000 +/- resudebtuak kits	76	84	89	91	89	87	0.78	5.99	75	1.00	4.91	1100	0.70	1.69	2.56	8.84	1175	16.5	13.8	8.25	89	0.0094	
P2- 88	0.8066	0.0013		7,000 +/- resudebtuak kits	76	84	89	91	89	88	0.78	0.81	200	1.00	8.02	920	0.54	1.49	2.26	8.70	1120	16.2	16.2	9.73	89	0.0013	
P2- 89	7.2895	0.0114		7,000 +/- resudebtuak kits	76	84	89	91	89	89	0.78	7.29	100	1.00	5.67	470	0.94	1.95	2.96	4.01	570	13.2	9.7	5.81	89	0.0114	
P2- 90	4.5258	0.0071		7,000 +/- resudebtuak kits	76	84	89	91	89	90	0.78	4.53	142	1.00	6.76	590	1.37	2.37	3.59	3.94	732	14.1	10.7	6.42	89	0.0071	
P2- 91	1.4865	0.0023		7,000 +/- resudebtuak kits	76	84	89	91	89	91	0.78	1.49	170	1.00	7.40	400	0.52	1.46	2.22	4.55	570	13.2	12.0	7.17	89	0.0023	
P2- 92	5.2481	0.0082		7,000 +/- resudebtuak kits	76	84	89	91	89	92	0.78	5.25	132	1.00	6.52	810	0.94	1.96	2.96	6.00	942	15.2	12.5	7.51	89	0.0082	
P2- 93	3.94	0.0061		7,000 +/- resudebtuak kits	76	84	89	91	89	93	0.78	3.94	120	1.00	6.22	680	0.72	1.71	2.80	6.02	800	14.4	12.2	7.34	89	0.0061	
P2- 94	4.43	0.0069		7,000 +/- resudebtuak kits	76	84	89	91	89	94	0.78	4.43	130	1.00	6.47	350	0.89	1.91	2.89	3.06	480	12.7	9.5	5.72	89	0.0069	
		0.3203																									0.3203	

	URBAN AREAS					K = 0.0132*Cn-0.39	Tt = 1.8*(1.1-K)*L^(1/2)/(S^(1/3))	Generalized Manning's Equations	
Notes:								Existing Conditions	Developed Conditions
	1.01	Open space - poor	68	79	86	89			
	1.02	Open space - fair	49	69	79	84			
	1.03	Open space/parks - good	39	61	74	80		V1 = 14.8*(S/100)^0.5	V1 = 20.2*(S/100)^0.5
	1.04	Paved (excludes right-of-way)	98	98	98	98			
	1.05	Paved: curbs and storm drains	98	98	98	98		V2 = 29.4*(S/100)^0.5	V2 = 30.6*(S/100)^0.5
	1.06	Paved: open ditches (includes R/W)	83	89	92	93			
	1.07	Gravel (includes R/W)	76	85	89	91			
	1.08	Dirt (includes R/W)	72	82	87	89			
	1.11	Commercial & Business	89	92	94	95			
	1.12	Industriel	81	88	91	93			
	1.13	Apartments/Condos	81	88	91	93			
	1.14	Townhouses/<= 6000 sq. ft.	80	87	90	92			
	1.15	7000 sq. ft. lots	76	84	89	91			
	1.16	8000 sq. ft. lots	73	82	88	90			
	1.17	10,000 sq. ft. lots	61	75	83	87			
	1.18	14,000 sq. ft. lots	57	72	81	86			
	1.19	20,000 sq. ft. lots	54	70	80	85			
	1.20	40,000 sq. ft. lots	51	68	79	84			
	1.21	80,000 sq. ft. lots	48	65	77	82			

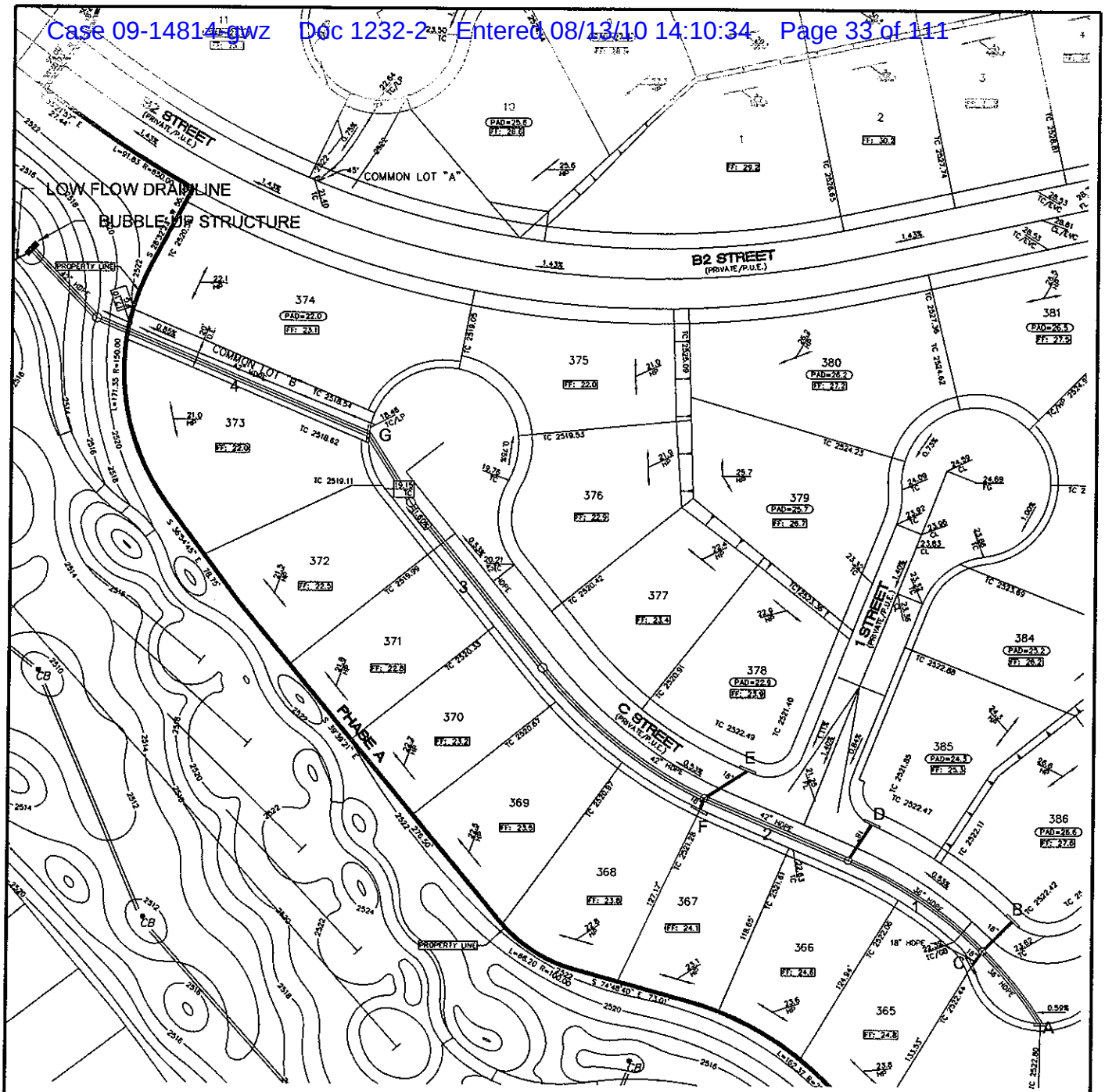
Kinematic Routing

Reach	Length (ft)	slope	Manning "n"	Sub reaches	Shape	Width	Side Slope (xH:V)
R-JN10	1134	0.011	0.016	5	Trapezoid	60	0.5
R-JN11	260	0.006	0.016	5	Trapezoid	60	0.5
R-JN12	270	0.007	0.016	5	Trapezoid	60	0.5
R-JN13	180	0.006	0.016	5	Trapezoid	60	0.5
R-JN14	200	0.01	0.016	5	Trapezoid	60	0.5
R-JN18	1016	0.011	0.016	5	Trapezoid	60	0.5
R-JN19	490	0.005	0.016	5	Trapezoid	60	0.5
R-JN21	140	0.017	0.016	5	Trapezoid	60	0.5
R-JN22	130	0.0114	0.016	5	Trapezoid	60	0.5
R-JN26	490	0.005	0.016	5	Trapezoid	60	0.5
R-JN31	480	0.0079	0.016	5	Trapezoid	60	0.5
R-JN32	640	0.005	0.016	5	Trapezoid	60	0.5
R-JN6	1084	0.011	0.016	5	Trapezoid	60	0.5
R-JN7	1590	0.009	0.016	5	Trapezoid	60	0.5
R-JN8	137	0.014	0.016	5	Trapezoid	60	0.5
R-JS17	725	0.008	0.016	5	Trapezoid	60	0.5
R-JS18	1480	0.006	0.016	5	Trapezoid	60	0.5
R-JS19	1480	0.006	0.016	5	Trapezoid	60	0.5
R-JS21	230	0.005	0.016	5	Trapezoid	60	0.5
R-P260	730	0.015	0.016	5	Trapezoid	60	0.5
R-P261	1310	0.01	0.016	5	Trapezoid	60	0.5
R-P265	1238	0.007	0.016	5	Trapezoid	60	0.5
R-P279	811	0.005	0.016	5	Trapezoid	60	0.5
R-P282	915	0.008	0.016	5	Trapezoid	60	0.5
R-P285	850	0.008	0.016	5	Trapezoid	60	0.5
R-P286	900	0.008	0.016	5	Trapezoid	60	0.5
R-P291	590	0.01	0.016	5	Trapezoid	60	0.5

APPENDIX B

DRAINAGE INFRASTRUCTURE CALCULATIONS

- COMMON LOT B (J-N23)
- COMMON LOT R (J-N30)
- COMMON LOT H (J-N15)
- COMMON LOT L (J-S20)
- COMMON LOT O (P2-67)



STORM DRAIN SYSTEM					
INLET	SIZE	Qinlet	Qintercept	Qbypass	Grade/Sump
A	8.5	48	12	36	G
B	11.5	47	17	30	G
C	11.5	36	15	21	G
D	11.5	27	12	15	G
E	11.5	22	11	11	G
F	8.5	21	8	13	G
G	11.5	36	11	25	S

SD PIPES		
PIPE	Qpipe	Size
1	44	A
2	56	B
3	75	C
4	86	48

BUBBLE-UP STR			
PIPE	Type	Open Area	
48	Type 8	10 x 3.5	

REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RJM
CHECKED
APPROVED
APPROVED
DATE 3/02/06

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 2 – PHASE A

COMMON LOT B
NODE J-N23

SCALE 1" = 100'

NO. A

REV. 0

FILENAME
CADD A1-R3

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod 2
Project Name.:Golden Valley Ranch
Computed by :rjm

Project Description

COMMON EASEMENT B
NODE J-N23
INLET A

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

			Composite
	Cross Slope		
S	Longitudinal Slope	(ft/ft)	0.0059
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		44.000
T	Width of Spread (ft)		32.77

Gutter Flow

Eo	Gutter Flow Ratio	0.131
d	Depth of Flow (ft)	0.75
V	Average Velocity (ft/sec)	4.07

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	49.95	4.25	0.05	2.148	41.852
Parallel Bar P-1-7/8	1.50	2.88	0.23	9.580	32.271
Combination			0.27	11.729	32.271

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod 2
Project Name.:Golden Valley Ranch
Computed by :rjm

Project Description

COMMON EASEMENT B
NODE J-N23
INLET B

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

			Composite
	Cross Slope		
S	Longitudinal Slope	(ft/ft)	0.0053
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		43.000
T	Width of Spread (ft)		33.15

Gutter Flow

Eo	Gutter Flow Ratio	0.129
d	Depth of Flow (ft)	0.76
V	Average Velocity (ft/sec)	3.89

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	48.09	5.75	0.05	2.180	40.820
Parallel Bar P-1-7/8	1.50	4.38	0.36	14.644	26.176
Combination			0.39	16.824	26.176

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod 2
Project Name.:Golden Valley Ranch
Computed by :rjm

Project Description

COMMON EASEMENT B
NODE J-N23
INLET C

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope		Composite
S	Longitudinal Slope	(ft/ft)	0.0053
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		36.000
T	Width of Spread (ft)		31.00

Gutter Flow

Eo	Gutter Flow Ratio	0.138
d	Depth of Flow (ft)	0.71
V	Average Velocity (ft/sec)	3.72

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	43.62	5.75	0.06	2.009	33.991
Parallel Bar P-1-7/8	1.50	4.38	0.38	12.916	21.075
Combination			0.41	14.925	21.075

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod 2
Project Name.:Golden Valley Ranch
Computed by :rjm

Project Description

COMMON EASEMENT B
NODE J-N23
INLET D

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

			Composite
	Cross Slope		
S	Longitudinal Slope	(ft/ft)	0.0053
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		27.000
T	Width of Spread (ft)		27.80

Gutter Flow

Eo	Gutter Flow Ratio	0.155
d	Depth of Flow (ft)	0.65
V	Average Velocity (ft/sec)	3.46

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	37.19	5.75	0.07	1.764	25.236
Parallel Bar P-1-7/8	1.50	4.38	0.42	10.501	14.736
Combination			0.45	12.264	14.736

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod 2
Project Name.:Golden Valley Ranch
Computed by :rjm

Project Description

COMMON EASEMENT B
NODE J-N23
INLET E

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

			Composite
	Cross Slope		
S	Longitudinal Slope	(ft/ft)	0.0053
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		22.000
T	Width of Spread (ft)		25.73

Gutter Flow

Eo	Gutter Flow Ratio	0.168
d	Depth of Flow (ft)	0.61
V	Average Velocity (ft/sec)	3.29

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	33.16	5.75	0.07	1.609	20.391
Parallel Bar P-1-7/8	1.50	4.38	0.44	9.034	11.357
Combination			0.48	10.643	11.357

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod 2
Project Name.:Golden Valley Ranch
Computed by :rjm

Project Description

COMMON EASEMENT B
NODE J-N23
INLET F

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

			Composite
	Cross Slope		
S	Longitudinal Slope	(ft/ft)	0.0053
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		21.000
T	Width of Spread (ft)		25.28

Gutter Flow

Eo	Gutter Flow Ratio	0.172
d	Depth of Flow (ft)	0.60
V	Average Velocity (ft/sec)	3.25

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	32.30	4.25	0.08	1.576	19.424
Parallel Bar P-1-7/8	1.50	2.88	0.31	5.974	13.450
Combination			0.36	7.550	13.450

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Sag
Date: 03/10/2006

Project No. :18449
Project Name.:GOLDEN VALLEY RANCH
Computed by :rjm

Project Description
SAG INLETS - ALL PODS
MODIFIED "C" L-11.5
NODE J-N23 INLET 6
Inlets on Sag: Sweeper Combination Inlet

Roadway and Discharge Data

	Cross Slope	Composite/Dep
Sx	Pavement Cross Slope (ft/ft)	0.0100
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00

Inlet Interception

	Inlet Type *Sag*	Curb-Opening
L	Curb-Opening Length (ft)	5.75
H	Curb-Opening Height (in)	6.00
	Inlet Type *Sag*	Parallel Bar P-1-7/8
T	Width of Spread (ft)	39.48
WGR	Grate Width (ft)	1.50
L	Grate Length (ft)	4.38
	Inlet Type *Sag*	Sweeper Combination
d_ave	Depth of Flow (ft)	0.526
d_curb	Depth at Curb (ft)	0.671
Qi	Intercepted Flow (cfs)	11.000

Note: The curb opening length in the input screen is the total of the curb opening including its length along the grate.

Worksheet

Worksheet for Triangular Channel

Project Description	
Worksheet	COMMON LOT B - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.020	
Channel Slope	0.005000	ft/ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	25.00	cfs

Results		
Depth	0.61	ft
Flow Area	10.6	ft²
Wetted Perimeter	34.89	ft
Top Width	34.87	ft
Critical Depth	0.54	ft
Critical Slope	0.009014	ft/ft
Velocity	2.37	ft/s
Velocity Head	0.09	ft
Specific Energy	0.69	ft
Froude Number	0.76	
Flow Type	Subcritical	

VELOCITY x DEPTH

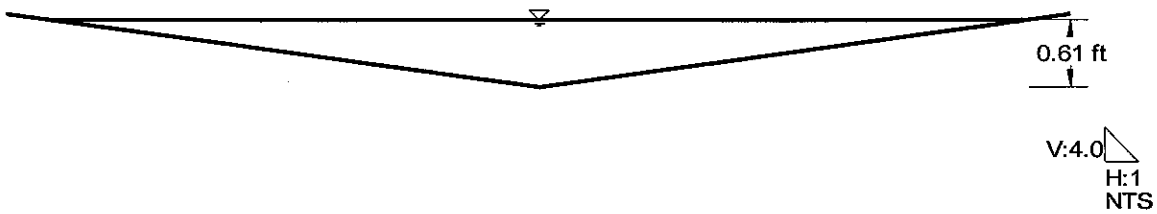
2.4 x 0.6 = 1.4 < 0.6.

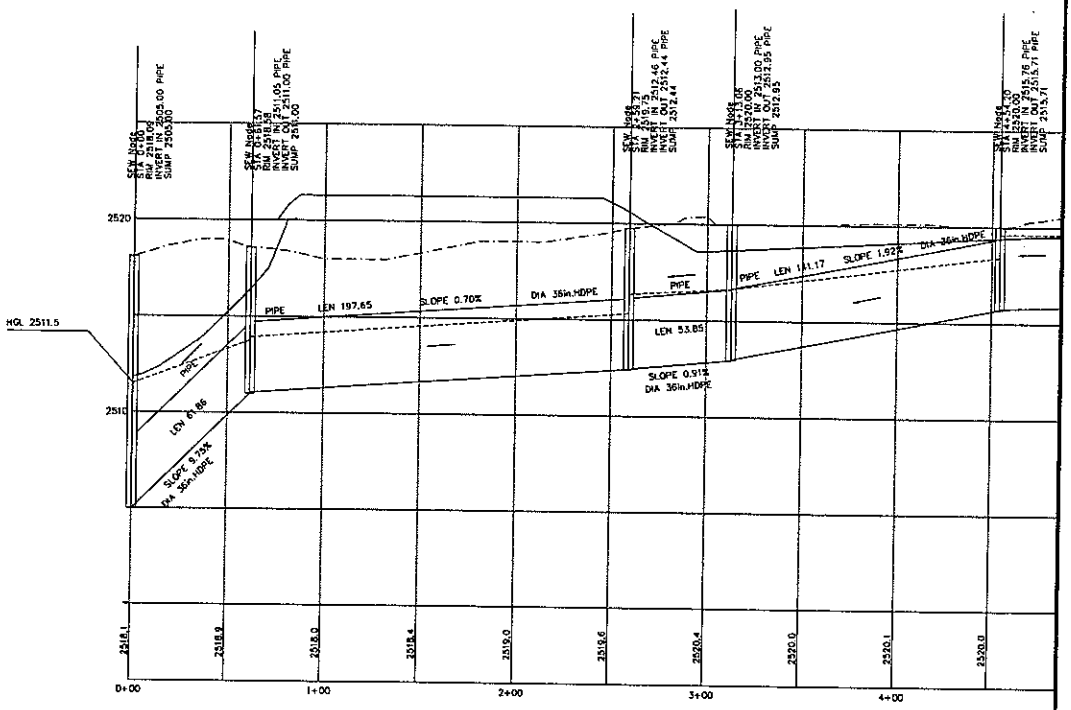
Cross Section

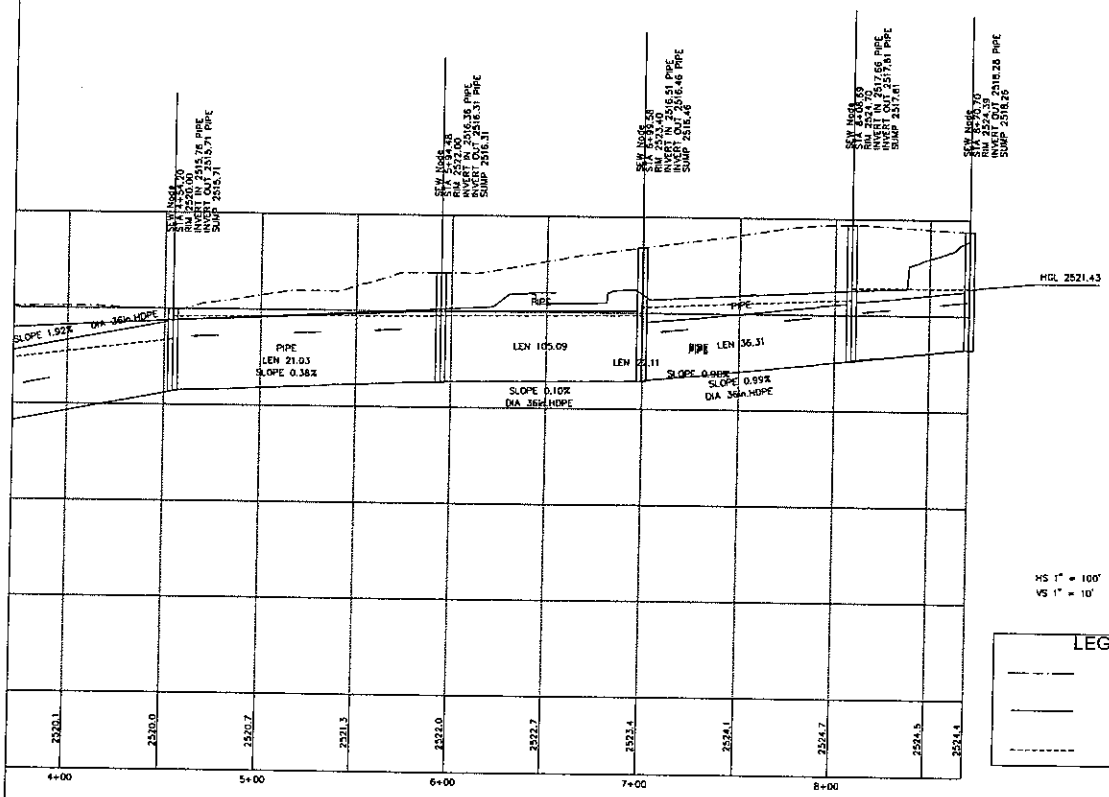
Cross Section for Triangular Channel

Project Description	
Worksheet	COMMON LOT B - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.020	
Channel Slope	0.005000	ft/ft
Depth	0.61	ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	25.00	cfs







HS 1" = 100'
VS 1" = 10'

LEGEND
- Exisiting Grade
- Finish Grade
- HGL

REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RN
CHECKED
APPROVED
APPROVED
DATE DATE

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 2 – PHASE A

COMMON LOT B
NODE J-N23

SCALE 1:1

NO. A

REV. 0

Q:\18449\dwg\design\SD_PRO\POD2\POD2_C_str.dwg, 3/16/2006 5:55:07 PM, \\vg-ps1\hp5100-eng, 1:1
$$$$$$$$$$$$FILENAME$$$$$$$$$$$$
CADD A1-R3 © STANLEY CONSULTANTS

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

STORM DRAIN AT POD2 C STR J-N23.DAT

DATE: 3/15/2006
TIME: 14: 9

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	36	4			3.00														
CD	42	4			3.50														
CD	54	4			4.50														
CD	12	4			1.00														
CD	48	4			4.00														
CD	30	4			2.50														
CD	27	4			2.25														
CD	24	4			2.00														
CD	18	4			1.50														
CD	21	4			1.75														

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET

U/S DATA	STATION	INVERT	SECT	W S ELEV
	100.00	2505.00	42	2511.50

ELEMENT NO 2 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	159.00	2511.00	42	0.013	0.00	0.00	0.00	0

ELEMENT NO 3 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	164.00	2511.05	42	0	0	0.013	0.0	0.0	0.00	0.00	0.00	0.00

ELEMENT NO 4 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	357.00	2512.44	42	0.013	0.00	0.00	0.00	0

ELEMENT NO 5 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	362.00	2512.46	42	18	0	0.013	11.0	0.0	2512.46	0.00	90.00	0.00

ELEMENT NO 6 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	411.00	2512.95	42	0.013	0.00	0.00	0.00	0

ELEMENT NO 7 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	416.00	2513.00	42	0	0	0.013	0.0	0.0	0.00	0.00	0.00	0.00

ELEMENT NO 8 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	687.00	2515.71	42	0.013	320.00	0.00	0.00	0

ELEMENT NO 9 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	692.00	2515.76	42	18	18	0.013	11.0	8.0	2515.76	2515.76	45.00	90.00

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 10 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	747.00	2516.31	42	0.013	0.00	0.00	0.00	0

ELEMENT NO 11 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	752.00	2516.36	42	0	0	0.013	0.0	0.0	0.00	0.00	0.00	0.00

ELEMENT NO 12 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	792.00	2516.46	42	0.013	0.00	0.00	0.00	0

ELEMENT NO 13 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	797.00	2516.51	42	18	0	0.013	12.0	0.0	2516.51	0.00	90.00	0.00

WARNING - ADJACENT SECTIONS ARE NOT IDENTICAL - SEE SECTION NUMBERS AND CHANNEL DEFINITIONS

ELEMENT NO 14 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	907.00	2517.61	36	0.013	288.00	0.00	0.00	0

ELEMENT NO 15 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	912.00	2517.66	36	18	18	0.013	15.0	17.0	2517.66	2517.66	90.00	45.00

ELEMENT NO 16 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	974.00	2518.28	36	0.013	0.00	0.00	0.00	0

ELEMENT NO 17 IS A SYSTEM HEADWORKS

U/S DATA	STATION	INVERT	SECT	W S ELEV
	974.00	2518.28	36	0.00

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC

LICENSEE: STANLEY CONSULTANTS, INC. F0515P PAGE 1

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
MAIN STORM DRAIN FILE J-N23.DAT

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	2505.00	6.500	2511.500	86.0	8.94	1.241	2512.741	0.00	2.887		3.50	0.00	0.00	0	0.00
14.20	0.10169					.007307	0.10			1.237			0.00		
114.20	2506.44	5.162	2511.606	86.0	8.94	1.241	2512.847	0.00	2.887		3.50	0.00	0.00	0	0.00
HYDRAULIC JUMP													0.00		
114.20	2506.44	1.594	2508.038	86.0	20.16	6.314	2514.352	0.00	2.887		3.50	0.00	0.00	0	0.00
4.86	0.10169					.038895	0.19			1.237			0.00		
119.06	2506.94	1.628	2508.567	86.0	19.60	5.967	2514.534	0.00	2.887		3.50	0.00	0.00	0	0.00
7.22	0.10169					.035159	0.25			1.237			0.00		
126.28	2507.67	1.690	2509.363	86.0	18.69	5.425	2514.788	0.00	2.887		3.50	0.00	0.00	0	0.00
6.07	0.10169					.030947	0.19			1.237			0.00		
132.35	2508.29	1.754	2510.044	86.0	17.82	4.931	2514.975	0.00	2.887		3.50	0.00	0.00	0	0.00
5.12	0.10169					.027252	0.14			1.237			0.00		
137.47	2508.81	1.821	2510.632	86.0	16.99	4.484	2515.116	0.00	2.887		3.50	0.00	0.00	0	0.00
4.33	0.10169					.024020	0.10			1.237			0.00		
141.80	2509.25	1.892	2511.143	86.0	16.20	4.076	2515.219	0.00	2.887		3.50	0.00	0.00	0	0.00
3.69	0.10169					.021191	0.08			1.237			0.00		
145.49	2509.63	1.966	2511.592	86.0	15.45	3.704	2515.296	0.00	2.887		3.50	0.00	0.00	0	0.00
3.10	0.10169					.018715	0.06			1.237			0.00		
148.59	2509.94	2.045	2511.987	86.0	14.73	3.368	2515.355	0.00	2.887		3.50	0.00	0.00	0	0.00
2.63	0.10169					.016550	0.04			1.237			0.00		
151.22	2510.21	2.128	2512.336	86.0	14.04	3.062	2515.398	0.00	2.887		3.50	0.00	0.00	0	0.00
2.18	0.10169					.014656	0.03			1.237			0.00		

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
MAIN STORM DRAIN FILE J-N23.DAT

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
153.40	2510.43	2.216	2512.647	86.0	13.39	2.784	2515.431	0.00	2.887		3.50	0.00	0.00	0	0.00
1.80	0.10169					.013001	0.02			1.237			0.00		
155.20	2510.61	2.310	2512.923	86.0	12.77	2.530	2515.453	0.00	2.887		3.50	0.00	0.00	0	0.00
1.44	0.10169					.011557	0.02			1.237			0.00		
156.64	2510.76	2.410	2513.170	86.0	12.17	2.301	2515.471	0.00	2.887		3.50	0.00	0.00	0	0.00
1.11	0.10169					.010299	0.01			1.237			0.00		
157.75	2510.87	2.518	2513.390	86.0	11.61	2.092	2515.482	0.00	2.887		3.50	0.00	0.00	0	0.00
0.79	0.10169					.009209	0.01			1.237			0.00		
158.54	2510.95	2.635	2513.588	86.0	11.07	1.901	2515.489	0.00	2.887		3.50	0.00	0.00	0	0.00
0.46	0.10169					.008275	0.00			1.237			0.00		
159.00	2511.00	2.765	2513.765	86.0	10.55	1.729	2515.494	0.00	2.887		3.50	0.00	0.00	0	0.00
JUNCT STR	0.01000					.007535	0.04						0.00		
164.00	2511.05	2.887	2513.937	86.0	10.13	1.594	2515.531	0.00	2.887		3.50	0.00	0.00	0	0.00
1.32	0.00720					.007215	0.01			2.891			0.00		
165.32	2511.06	2.891	2513.951	86.0	10.12	1.590	2515.541	0.00	2.887		3.50	0.00	0.00	0	0.00
191.68	0.00720					.007204	1.38			2.891			0.00		
357.00	2512.44	2.891	2515.331	86.0	10.12	1.590	2516.921	0.00	2.887		3.50	0.00	0.00	0	0.00
JUNCT STR	0.00400					.006382	0.03						0.00		
362.00	2512.46	3.882	2516.342	75.0	7.80	0.944	2517.286	0.00	2.711		3.50	0.00	0.00	0	0.00
49.00	0.01000					.005557	0.27			2.251			0.00		
411.00	2512.95	3.664	2516.614	75.0	7.80	0.944	2517.558	0.00	2.711		3.50	0.00	0.00	0	0.00
JUNCT STR	0.01000					.005557	0.03						0.00		

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
MAIN STORM DRAIN FILE J-N23.DAT

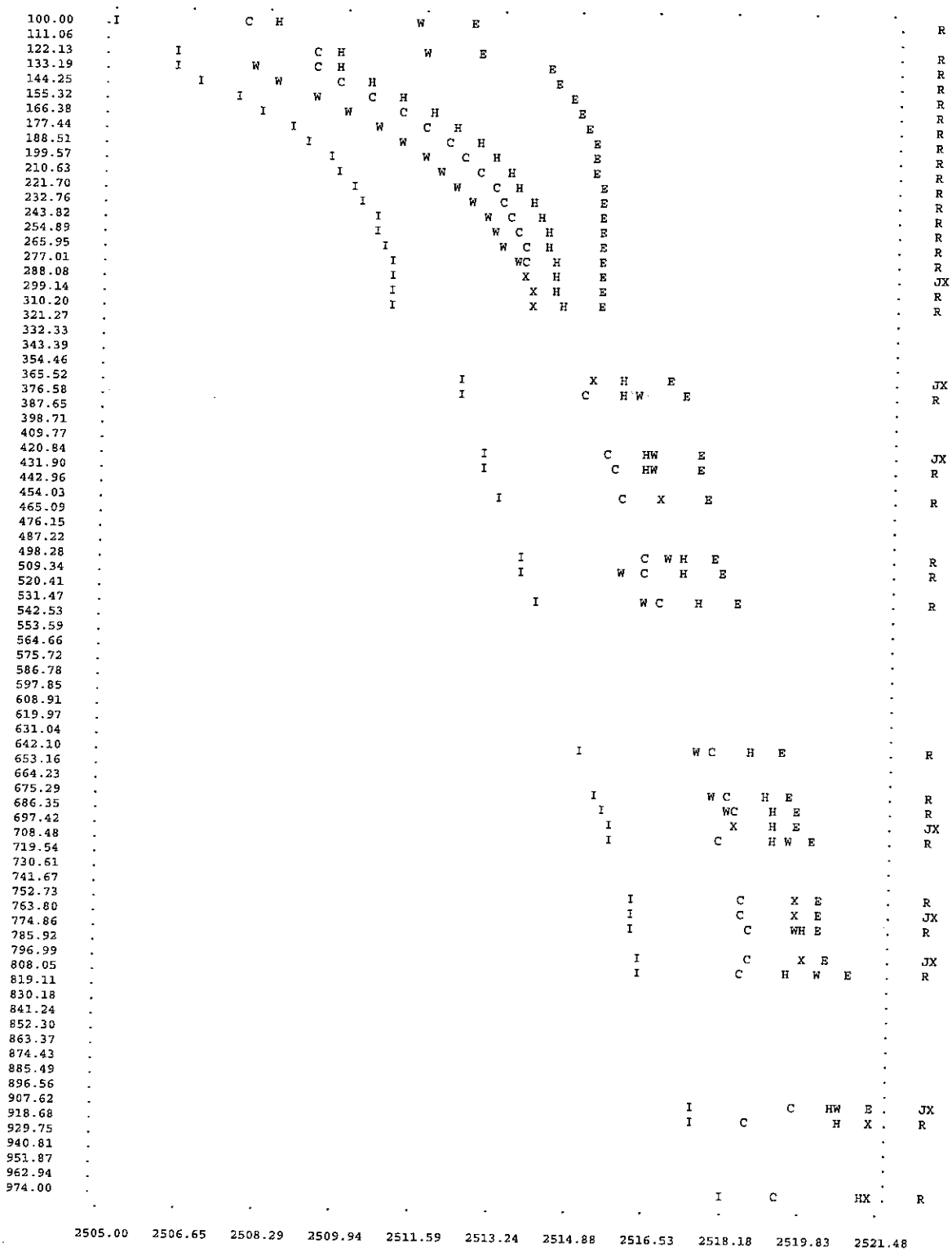
STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
416.00	2513.00	3.642	2516.642	75.0	7.80	0.944	2517.586	0.00	2.711		3.50	0.00	0.00	0	0.00
31.88	0.01000					.005517	0.18			2.251			0.00		
447.88	2513.32	3.500	2516.819	75.0	7.80	0.944	2517.763	0.00	2.711		3.50	0.00	0.00	0	0.00
42.80	0.01000					.005151	0.22			2.251			0.00		
490.68	2513.75	3.217	2516.964	75.0	8.10	1.020	2517.984	0.00	2.711		3.50	0.00	0.00	0	0.00
HYDRAULIC JUMP													0.00		
490.68	2513.75	2.270	2516.017	75.0	11.36	2.003	2518.020	0.00	2.711		3.50	0.00	0.00	0	0.00
37.04	0.01000					.009768	0.36			2.251			0.00		
527.72	2514.12	2.270	2516.387	75.0	11.35	2.002	2518.389	0.00	2.711		3.50	0.00	0.00	0	0.00
107.66	0.01000					.009220	0.99			2.251			0.00		
635.38	2515.19	2.368	2517.562	75.0	10.82	1.819	2519.381	0.00	2.711		3.50	0.00	0.00	0	0.00
34.27	0.01000					.008208	0.28			2.251			0.00		
669.65	2515.54	2.472	2518.008	75.0	10.32	1.654	2519.662	0.00	2.711		3.50	0.00	0.00	0	0.00
13.62	0.01000					.007329	0.10			2.251			0.00		
683.27	2515.67	2.586	2518.259	75.0	9.84	1.504	2519.763	0.00	2.711		3.50	0.00	0.00	0	0.00
3.73	0.01000					.006570	0.02			2.251			0.00		
687.00	2515.71	2.711	2518.421	75.0	9.38	1.366	2519.787	0.00	2.711		3.50	0.00	0.00	0	0.00
JUNCT STR	0.01000					.004658	0.02						0.00		
692.00	2515.76	3.844	2519.604	56.0	5.82	0.526	2520.130	0.00	2.343		3.50	0.00	0.00	0	0.00
49.91	0.01000					.003076	0.15			1.865			0.00		
741.91	2516.26	3.500	2519.759	56.0	5.82	0.526	2520.285	0.00	2.343		3.50	0.00	0.00	0	0.00
5.09	0.01000					.002948	0.02			1.865			0.00		

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
MAIN STORM DRAIN FILE J-N23.DAT

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
747.00	2516.31	3.461	2519.771	56.0	5.83	0.528	2520.299	0.00	2.343		3.50	0.00	0.00	0	0.00
JUNCT STR	0.01000					.002801	0.01						0.00		
752.00	2516.36	3.421	2519.781	56.0	5.85	0.532	2520.313	0.00	2.343		3.50	0.00	0.00	0	0.00
40.00	0.00250					.002770	0.11			3.500			0.00		
792.00	2516.46	3.434	2519.894	56.0	5.85	0.531	2520.425	0.00	2.343		3.50	0.00	0.00	0	0.00
JUNCT STR	0.01000					.002347	0.01						0.00		
797.00	2516.51	3.804	2520.314	44.0	6.22	0.602	2520.916	0.00	2.161		3.00	0.00	0.00	0	0.00
110.00	0.01000					.004352	0.48			1.780			0.00		
907.00	2517.61	3.182	2520.792	44.0	6.22	0.602	2521.394	0.00	2.161		3.00	0.00	0.00	0	0.00
JUNCT STR	0.01000					.002338	0.01						0.00		
912.00	2517.66	3.750	2521.410	12.0	1.70	0.045	2521.455	0.00	1.100		3.00	0.00	0.00	0	0.00
62.00	0.01000					.000324	0.02			0.860			0.00		
974.00	2518.28	3.150	2521.430	12.0	1.70	0.045	2521.475	0.00	1.100		3.00	0.00	0.00	0	0.00

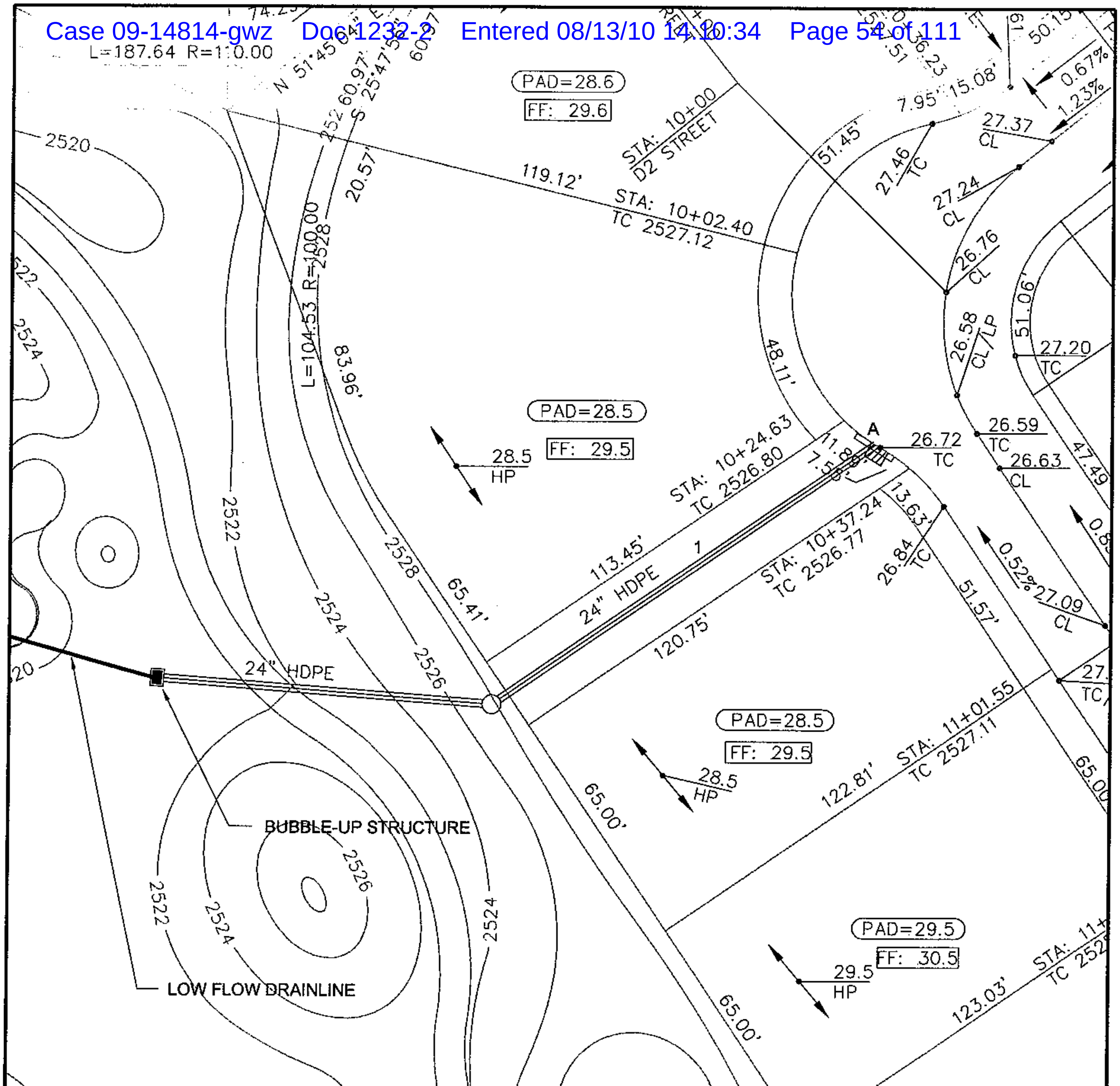
GOLDEN VALLEY RANCH
GOLDEN VALLEY
MAIN STORM DRAIN FILE J-N23.DAT



NOTES
1. GLOSSARY
I = INVERT ELEVATION

C = CRITICAL DEPTH
W = WATER SURFACE ELEVATION
H = HEIGHT OF CHANNEL
E = ENERGY GRADE LINE
X = CURVES CROSSING OVER
B = BRIDGE ENTRANCE OR EXIT
Y = WALL ENTRANCE OR EXIT

2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY



STORM DRAIN SYSTEM					
INLET	SIZE	Qinlet	Qintercept	Qbypass	Grade/Sump
A	17.5	40	15	25	S

SD PIPES		
PIPE	Qpipe	Size
1	15	A

BUBBLE-UP STR		
PIPE	Type	Open Area
24	Type F	2.5 x 3.5

REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RJM
CHECKED
APPROVED
APPROVED
DATE 3/02/06

RHOSES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 2 – PHASE A

COMMON LOT R
NODE J-N30

SCALE 1" = 40'
NO. A
REV. 0

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Sag
Date: 03/10/2006

Project No. :18449
Project Name.:GOLDEN VALLEY RANCH
Computed by :rjm

Project Description
SAG INLETS - ALL PODS
MODIFIED "C" L-17.5
NODE J-N30 INLET A Common Lot "R"
Inlets on Sag: Sweeper Combination Inlet

Roadway and Discharge Data

	Cross Slope		Composite/Dep
Sx	Pavement Cross Slope	(ft/ft)	0.0100
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00

Inlet Interception

	Inlet Type *Sag*		Curb-Opening
L	Curb-Opening Length	(ft)	8.75
H	Curb-Opening Height	(in)	6.00
	Inlet Type *Sag*		Parallel Bar P-1-7/8
T	Width of Spread	(ft)	39.00
WGR	Grate Width	(ft)	1.50
L	Grate Length	(ft)	7.38
	Inlet Type *Sag*		Sweeper Combination
d_ave	Depth of Flow	(ft)	0.521
d_curb	Depth at Curb	(ft)	0.667
Qi	Intercepted Flow	(cfs)	15.000

Note: The curb opening length in the input screen is the total of the curb opening including its length along the grate.

Worksheet

Worksheet for Triangular Channel

Project Description	
Worksheet	COMMON LOT R - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.020	
Channel Slope	0.005000	ft/ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	25.00	cfs

Results		
Depth	0.61	ft
Flow Area	10.6	ft²
Wetted Perimeter	34.89	ft
Top Width	34.87	ft
Critical Depth	0.54	ft
Critical Slope	0.009014	ft/ft
Velocity	2.37	ft/s
Velocity Head	0.09	ft
Specific Energy	0.69	ft
Froude Number	0.76	
Flow Type	Subcritical	

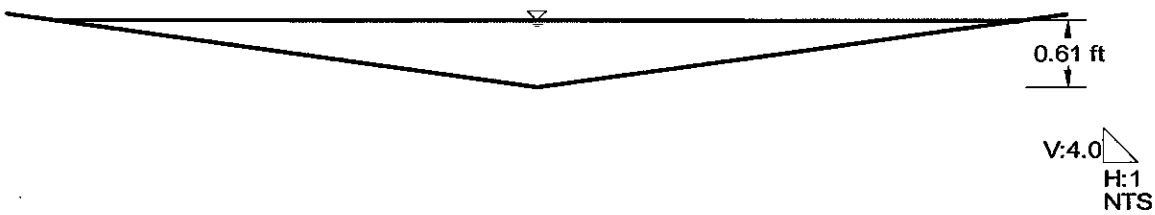
VELOCITY x DEPTH =

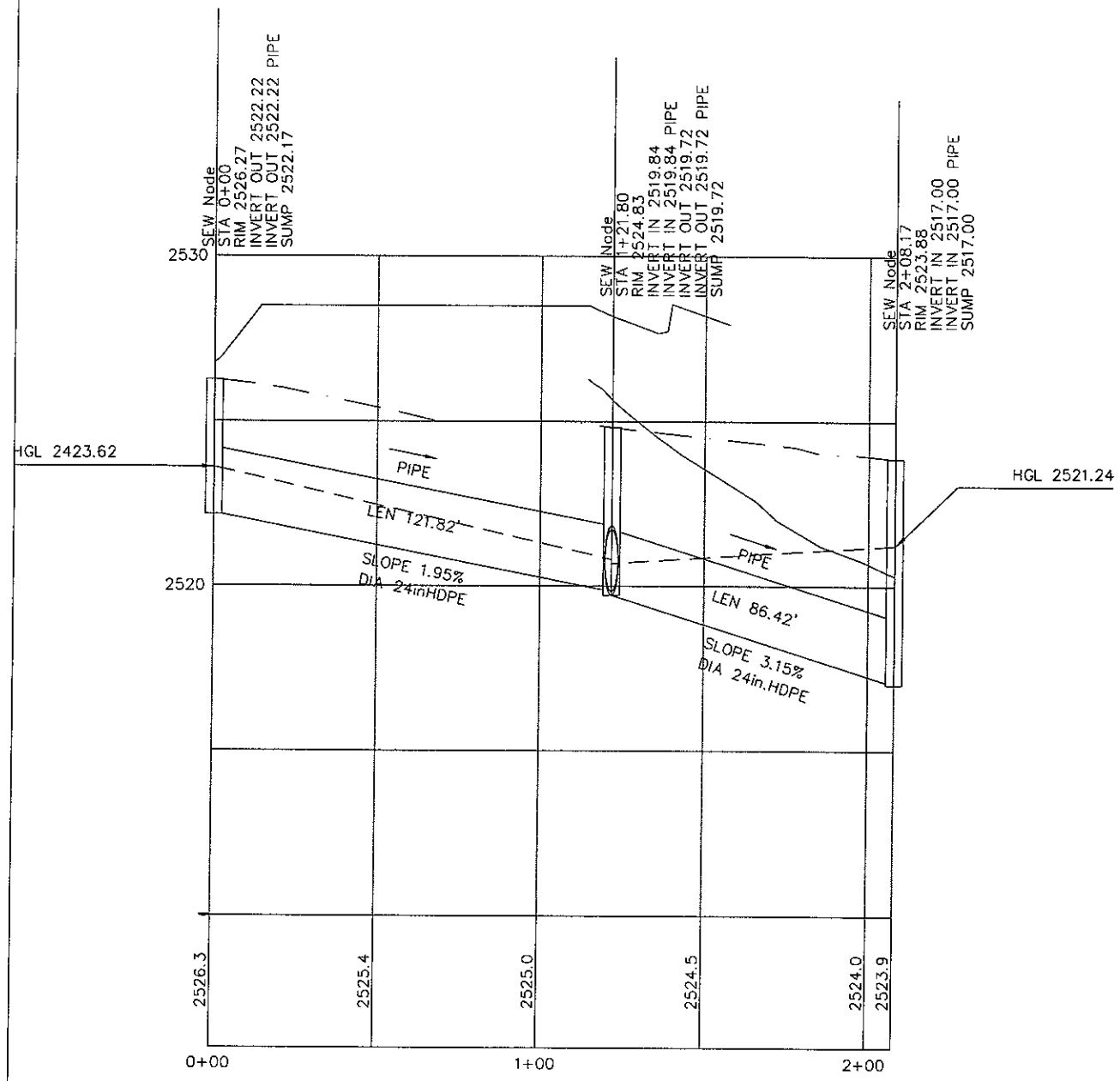
2.4 x 0.6 = 1.4 < 6.0

Cross Section
Cross Section for Triangular Channel

Project Description	
Worksheet	COMMON LOT R - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.020	
Channel Slope	0.005000	ft/ft
Depth	0.61	ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	25.00	cfs





REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RN
CHECKED
APPROVED
APPROVED
DATE DATE

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 2 - PHASE A

COMMON LOT R
NODE J-N30

SCALE

NO.	REV.
A	0

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

STORM DRAIN IN POD 2 ON D2 STREET FOR 19 CFS J-N30

DATE: 3/14/2006
TIME: 9:19

F0515P

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	24	4			2.00														

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET

U/S DATA	STATION	INVERT	SECT	W S ELEV
	100.00	2517.00	24	2521.24

ELEMENT NO 2 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	181.00	2519.72	24	0.013	0.00	0.00	0.00	0

ELEMENT NO 3 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	186.00	2519.84	24	0	0	0.013	0.0	0.0	0.00	0.00	0.00	0.00

ELEMENT NO 4 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	308.00	2522.22	24	0.013	0.00	0.00	0.00	0

ELEMENT NO 5 IS A SYSTEM HEADWORKS

U/S DATA	STATION	INVERT	SECT	W S ELEV
	308.00	2522.22	24	0.00

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC

LICENSEE: STANLEY CONSULTANTS, INC. F0515P PAGE 1

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
STORM DRAIN IN POD 2 ON D2 STREET FOR 19 CFS J-N30

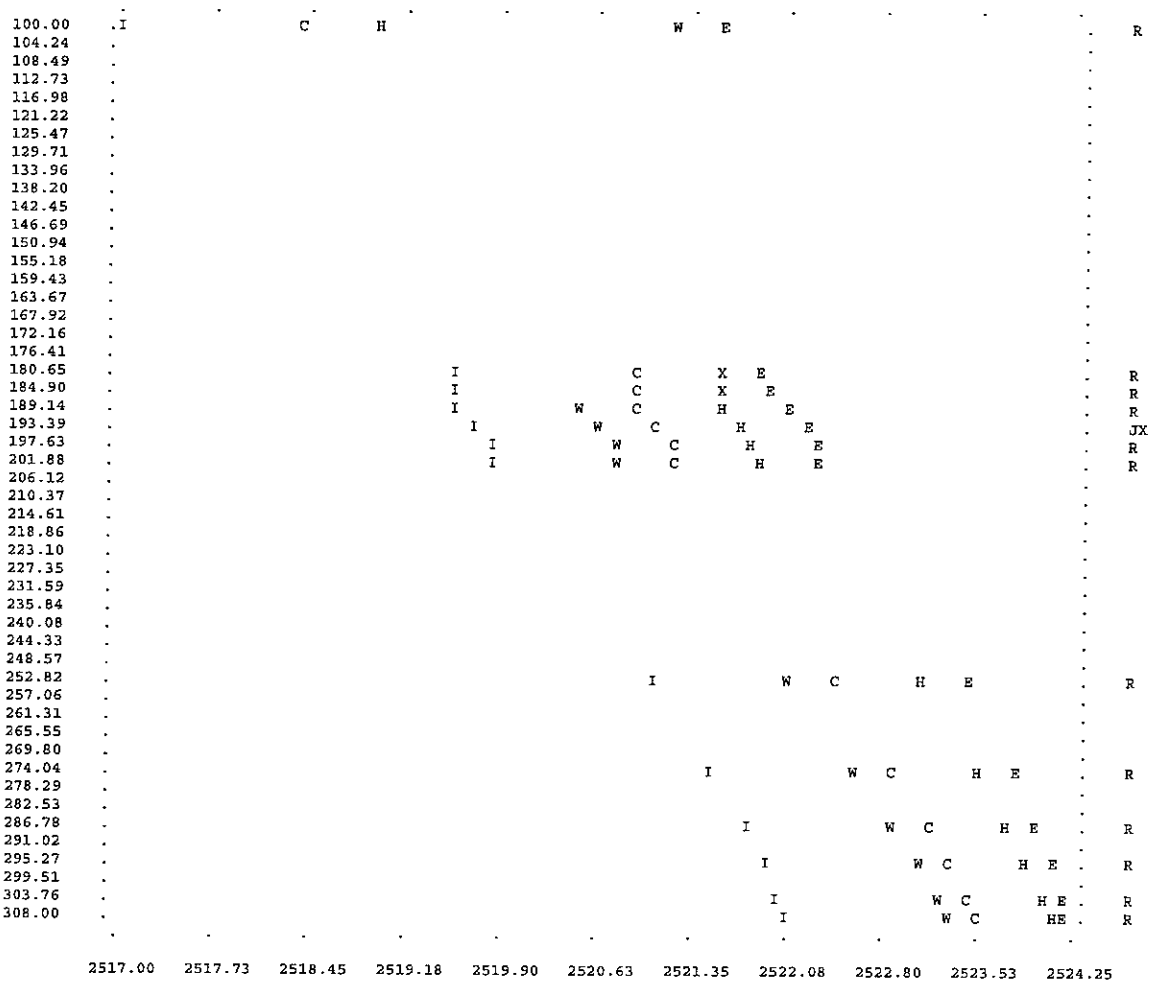
STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVEPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	2517.00	4.240	2521.240	15.0	4.77	0.354	2521.594	0.00	1.396		2.00	0.00	0.00	0	0.00
76.76	0.03358					.004354	0.33			0.830			0.00		
176.76	2519.58	2.000	2521.577	15.0	4.77	0.354	2521.931	0.00	1.396		2.00	0.00	0.00	0	0.00
0.46	0.03358					.004354	0.00			0.830			0.00		
177.22	2519.59	2.000	2521.593	15.0	4.77	0.354	2521.947	0.00	1.396		2.00	0.00	0.00	0	0.00
HYDRAULIC JUMP													0.00		
177.22	2519.59	0.954	2520.547	15.0	10.14	1.597	2522.144	0.00	1.396		2.00	0.00	0.00	0	0.00
3.78	0.03358					.020151	0.08			0.830			0.00		
181.00	2519.72	0.968	2520.688	15.0	9.95	1.538	2522.226	0.00	1.396		2.00	0.00	0.00	0	0.00
JUNCT STR	0.02400					.019366	0.10						0.00		
186.00	2519.84	0.976	2520.816	15.0	9.85	1.506	2522.322	0.00	1.396		2.00	0.00	0.00	0	0.00
1.34	0.01951					.019085	0.03			0.970			0.00		
187.34	2519.87	0.976	2520.842	15.0	9.84	1.504	2522.346	0.00	1.396		2.00	0.00	0.00	0	0.00
63.24	0.01951					.017930	1.13			0.970			0.00		
250.58	2521.10	1.013	2522.113	15.0	9.39	1.368	2523.481	0.00	1.396		2.00	0.00	0.00	0	0.00
22.98	0.01951					.015793	0.36			0.970			0.00		
273.56	2521.55	1.052	2522.600	15.0	8.95	1.244	2523.844	0.00	1.396		2.00	0.00	0.00	0	0.00
12.91	0.01951					.013924	0.18			0.970			0.00		
286.47	2521.80	1.093	2522.893	15.0	8.53	1.130	2524.023	0.00	1.396		2.00	0.00	0.00	0	0.00
8.28	0.01951					.012286	0.10			0.970			0.00		
294.75	2521.96	1.136	2523.097	15.0	8.13	1.027	2524.124	0.00	1.396		2.00	0.00	0.00	0	0.00
5.48	0.01951					.010856	0.06			0.970			0.00		

WATER SURFACE PROFILE LISTING

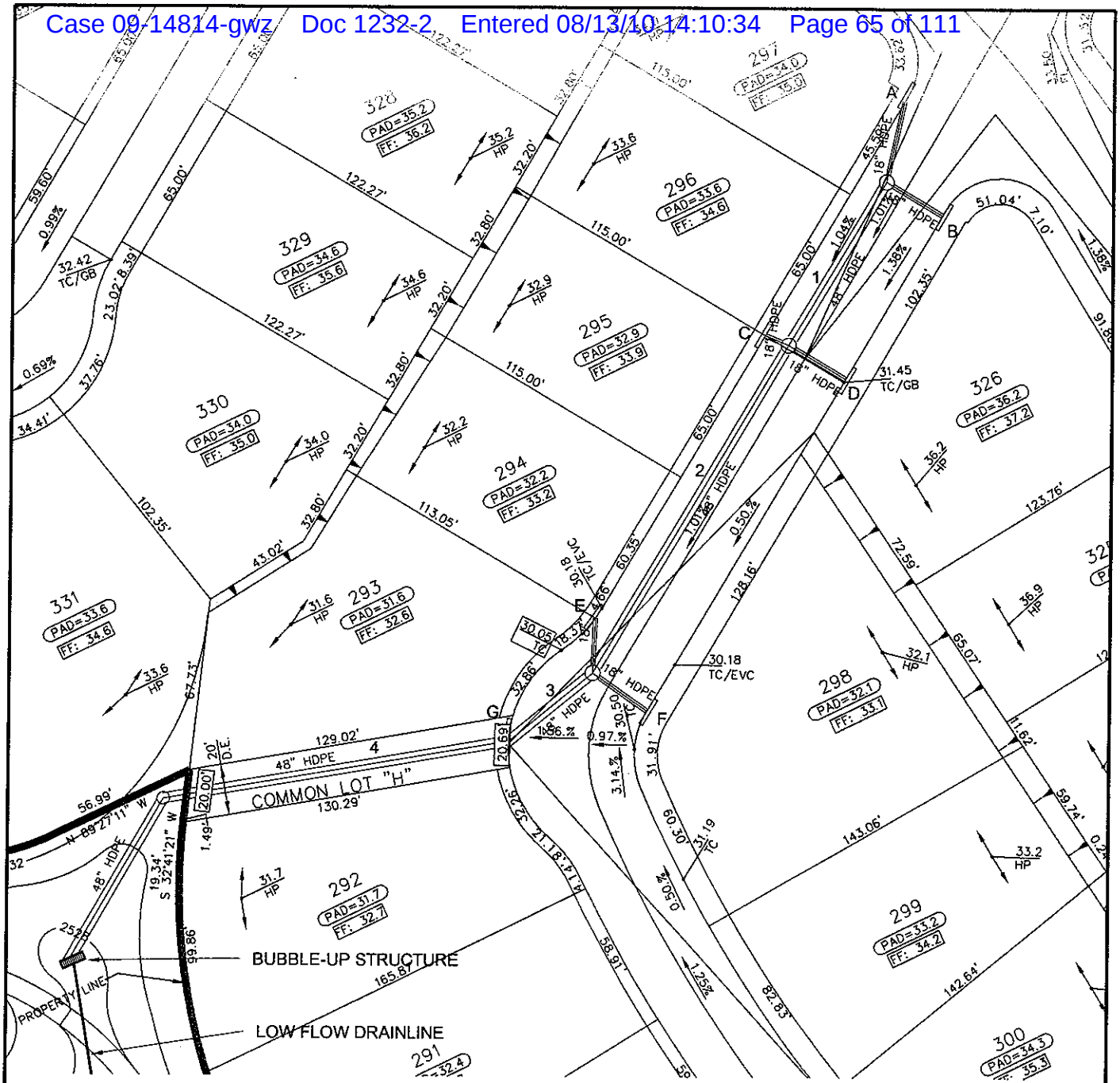
GOLDEN VALLEY RANCH
GOLDEN VALLEY
STORM DRAIN IN POD 2 ON D2 STREET FOR 19 CFS J-N30

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
300.23	2522.07	1.182	2523.250	15.0	7.76	0.934	2524.184	0.00	1.396		2.00	0.00	0.00	0	0.00
3.73	0.01951					.009604	0.04			0.970			0.00		
303.96	2522.14	1.230	2523.371	15.0	7.40	0.849	2524.220	0.00	1.396		2.00	0.00	0.00	0	0.00
2.38	0.01951					.008507	0.02			0.970			0.00		
306.34	2522.19	1.281	2523.469	15.0	7.05	0.772	2524.241	0.00	1.396		2.00	0.00	0.00	0	0.00
1.28	0.01951					.007550	0.01			0.970			0.00		
307.62	2522.21	1.336	2523.548	15.0	6.72	0.702	2524.250	0.00	1.396		2.00	0.00	0.00	0	0.00
0.38	0.01951					.006712	0.00			0.970			0.00		
308.00	2522.22	1.396	2523.616	15.0	6.40	0.637	2524.253	0.00	1.396		2.00	0.00	0.00	0	0.00

GOLDEN VALLEY RANCH
GOLDEN VALLEY
STORM DRAIN IN POD 2 ON D2 STREET FOR 19 CFS J-N30



N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY



STORM DRAIN SYSTEM					
INLET	SIZE	Qinlet	Qintercept	Qbypass	Grade/Sump
A	8.5	44	11	33	G
B	8.5	45	11	34	G
C	8.5	48	12	36	G
D	11.5	47	15	32	G
E	8.5	34	9	25	G
F	11.5	33	14	19	G
G	14.5	63	15	18	S

SD PIPES		
PIPE	Qpipe	Size
1	22	A
2	49	B
3	72	C
4	87	D

BUBBLE-UP STR		
PIPE	Type	Open Area
48	Type 8	10 X 3.5

REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RJM
CHECKED
APPROVED
APPROVED
DATE 3/02/06

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 2 – PHASE A

COMMON LOT H
NODE J-N15

SCALE 1" = 60'

NO.	REV.
A	0

$$$$$$$$$$$$$$FILENAME

CADD A1-R3

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod 2
Project Name.:Golden Valley Ranch
Computed by :rjm

Project Description

COMMON EASEMENT H
NODE J-N15
INLET A

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope		Composite
S	Longitudinal Slope	(ft/ft)	0.0104
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		44.000
T	Width of Spread (ft)		29.44

Gutter Flow

Eo	Gutter Flow Ratio	0.146
d	Depth of Flow (ft)	0.68
V	Average Velocity (ft/sec)	5.03

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	57.06	4.25	0.04	1.883	42.117
Parallel Bar P-1-7/8	1.50	2.88	0.21	9.054	33.062
Combination			0.25	10.938	33.062

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod 2
Project Name.:Golden Valley Ranch
Computed by :rjm

Project Description

COMMON EASEMENT H
NODE J-N15
INLET B

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope		Composite
S	Longitudinal Slope	(ft/ft)	0.0104
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		45.000
T	Width of Spread (ft)		29.69

Gutter Flow

Eo	Gutter Flow Ratio	0.145
d	Depth of Flow (ft)	0.69
V	Average Velocity (ft/sec)	5.06

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	57.77	4.25	0.04	1.903	43.097
Parallel Bar P-1-7/8	1.50	2.88	0.21	9.184	33.914
Combination			0.25	11.086	33.914

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod 2
Project Name.:Golden Valley Ranch
Computed by :rjm

Project Description

COMMON EASEMENT H
NODE J-N15
INLET C

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope		Composite
S	Longitudinal Slope	(ft/ft)	0.0101
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		48.000
T	Width of Spread (ft)		30.60

Gutter Flow

Eo	Gutter Flow Ratio	0.140
d	Depth of Flow (ft)	0.71
V	Average Velocity (ft/sec)	5.09

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	59.46	4.25	0.04	1.972	46.028
Parallel Bar P-1-7/8	1.50	2.88	0.21	9.584	36.444
Combination			0.24	11.556	36.444

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod 2
Project Name.:Golden Valley Ranch
Computed by :rjm

Project Description

COMMON EASEMENT H
NODE J-N15
INLET D

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope		Composite
S	Longitudinal Slope	(ft/ft)	0.0101
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		47.000
T	Width of Spread (ft)		30.35

Gutter Flow

Eo	Gutter Flow Ratio	0.142
d	Depth of Flow (ft)	0.70
V	Average Velocity (ft/sec)	5.06

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	58.77	5.75	0.04	1.954	45.046
Parallel Bar P-1-7/8	1.50	4.38	0.30	13.416	31.631
Combination			0.33	15.369	31.631

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod 2
Project Name.:Golden Valley Ranch
Computed by :rjm

Project Description

COMMON EASEMENT H
NODE J-N15
INLET E

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope		Composite
S	Longitudinal Slope	(ft/ft)	0.0101
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		34.000
T	Width of Spread (ft)		26.85

Gutter Flow

Eo	Gutter Flow Ratio	0.161
d	Depth of Flow (ft)	0.63
V	Average Velocity (ft/sec)	4.67

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	49.09	4.25	0.05	1.689	32.311
Parallel Bar P-1-7/8	1.50	2.88	0.24	7.698	24.614
Combination			0.28	9.386	24.614

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod 2
Project Name.:Golden Valley Ranch
Computed by :rjm

Project Description

COMMON EASEMENT H
NODE J-N15
INLET F

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope		Composite
S	Longitudinal Slope	(ft/ft)	0.0050
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		33.000
T	Width of Spread (ft)		30.33

Gutter Flow

Eo	Gutter Flow Ratio	0.142
d	Depth of Flow (ft)	0.70
V	Average Velocity (ft/sec)	3.56

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	41.02	5.75	0.06	1.957	31.043
Parallel Bar P-1-7/8	1.50	4.38	0.40	12.308	18.734
Combination			0.43	14.266	18.734

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Sag
Date: 03/10/2006

Project No. :18449
Project Name.:GOLDEN VALLEY RANCH
Computed by :rjm

Project Description
SAG INLETS - ALL PODS
MODIFIED "C" L-17.5
NODE J-N 15 INLET G
Inlets on Sag: Sweeper Combination Inlet

Roadway and Discharge Data

		Composite/Dep
	Cross Slope	
Sx	Pavement Cross Slope (ft/ft)	0.0100
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00

Inlet Interception

		Curb-Opening
	Inlet Type *Sag*	
L	Curb-Opening Length (ft)	8.75
H	Curb-Opening Height (in)	6.00
	Inlet Type *Sag*	Parallel Bar P-1-7/8
T	Width of Spread (ft)	39.00
WGR	Grate Width (ft)	1.50
L	Grate Length (ft)	7.38
	Inlet Type *Sag*	Sweeper Combination
d_ave	Depth of Flow (ft)	0.521
d_curb	Depth at Curb (ft)	0.667
Qi	Intercepted Flow (cfs)	15.000

Note: The curb opening length in the input screen is the total of the curb opening including its length along the grate.

Worksheet

Worksheet for Triangular Channel

Project Description	
Worksheet	COMMON LOT H - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.020	
Channel Slope	0.010000	ft/ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	48.00	cfs

Results		
Depth	0.68	ft
Flow Area	13.3	ft²
Wetted Perimeter	39.12	ft
Top Width	39.10	ft
Critical Depth	0.70	ft
Critical Slope	0.008264	ft/ft
Velocity	3.62	ft/s
Velocity Head	0.20	ft
Specific Energy	0.88	ft
Froude Number	1.09	
Flow Type	Supercritical	

VELOCITY x DEPTH

3.6 x 0.7 = 2.5 < 6.0

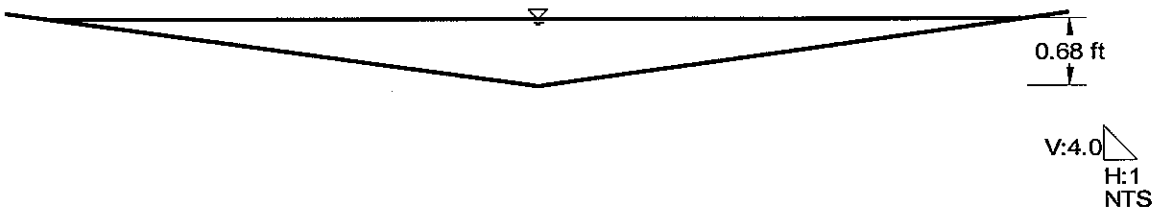
Stanley Consultants, Inc
37 Brookside Road Waterbury, CT 06708 USA +1-203-755-1666

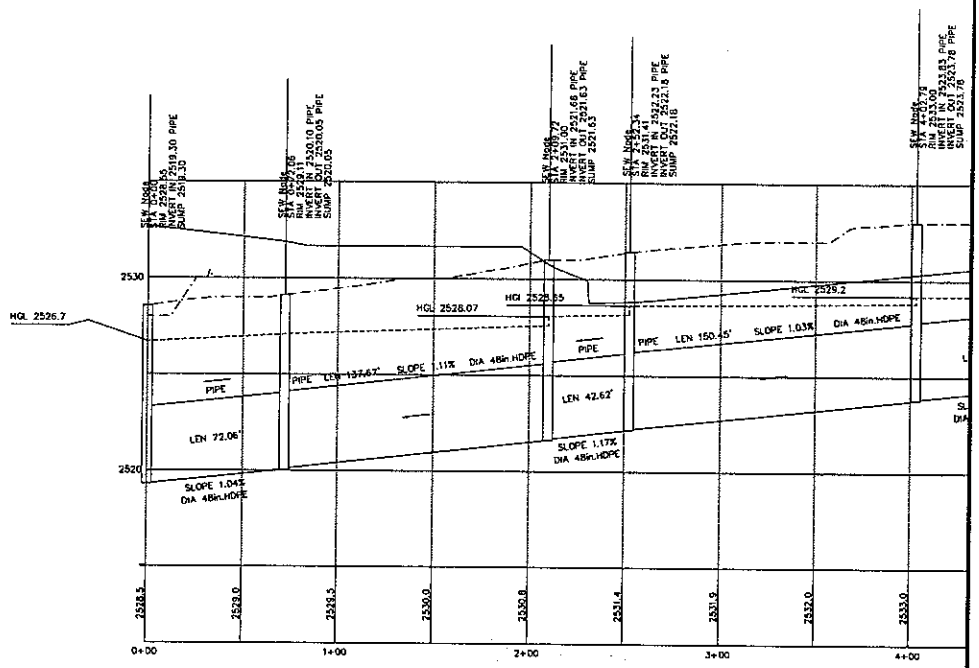
Cross Section

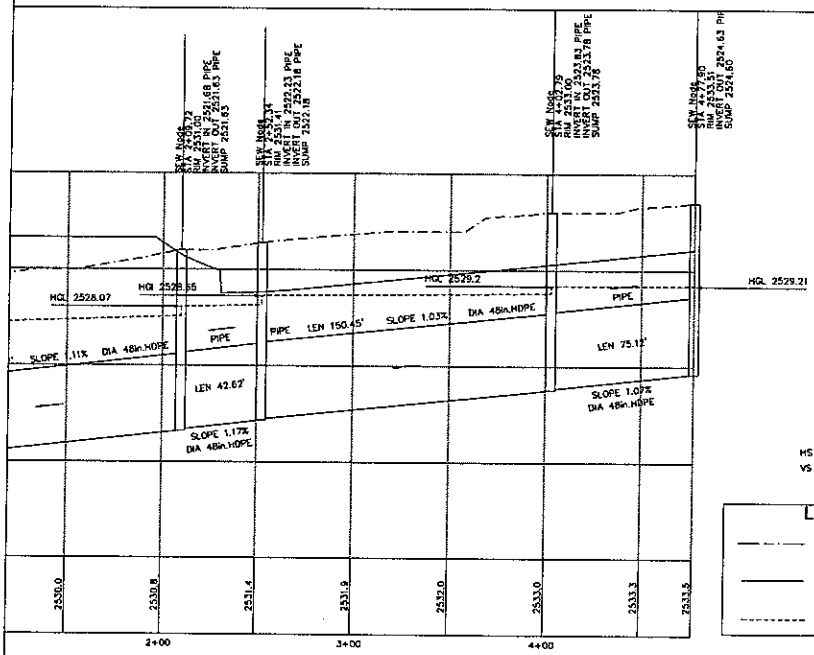
Cross Section for Triangular Channel

Project Description	
Worksheet	COMMON LOT H - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.020	
Channel Slope	0.010000	ft/ft
Depth	0.68	ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	48.00	cfs







HS 1" = 100'
VS 1" = 10'

LEGEND
- Exisiting Grade
- Finish Grade
- HGL

REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RN
CHECKED
APPROVED
APPROVED
DATE DATE

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 2 – PHASE A

COMMON LOT H
NODE J-N15

SCALE 1:1

NO. A

REV. 0

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$$$$$$$$$$$$$$$$FILENAME

CADD A1-R3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

STORM DRAIN IN POD 2 G2 STREET FOR 103 CFS

DATE: 3/15/2006
TIME: 14:35

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	48	4			4.00														
CD	60	4			5.00														
CD	54	4			4.50														
CD	36	4			3.00														
CD	66	3	0	0.00	4.00	6.00	0.00	0.00	0.00										
CD	30	4			2.50														
CD	18	4			1.50														
CD	42	4			3.50														

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET

U/S DATA	STATION	INVERT	SECT	W S ELEV
	100.00	2519.70	48	2526.70

ELEMENT NO 2 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	170.00	2520.40	48	0.013	0.00	0.00	50.00	0

ELEMENT NO 3 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	175.00	2520.45	48	0	0	0.013	0.0	0.0	0.00	0.00	0.00	0.00

ELEMENT NO 4 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	308.00	2521.88	48	0.013	0.00	0.00	0.00	0

ELEMENT NO 5 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	313.00	2521.93	48	18	0	0.013	15.0	0.0	2521.93	0.00	90.00	0.00

ELEMENT NO 6 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	353.00	2522.33	48	0.013	0.00	0.00	0.00	0

ELEMENT NO 7 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	358.00	2522.38	48	18	18	0.013	9.0	14.0	2522.38	2522.38	45.00	90.00

ELEMENT NO 8 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	503.00	2523.83	48	0.013	0.00	0.00	0.00	0

ELEMENT NO 9 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	508.00	2523.88	48	18	18	0.013	12.0	15.0	2523.88	2523.88	90.00	90.00

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 10 IS A REACH * * *

	U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
		583.00	2524.63	48	0.013	0.00	0.00	0.00	0

ELEMENT NO 11 IS A SYSTEM HEADWORKS * *

	U/S DATA	STATION	INVERT	SECT	W S ELEV
		583.00	2524.63	48	0.00

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC

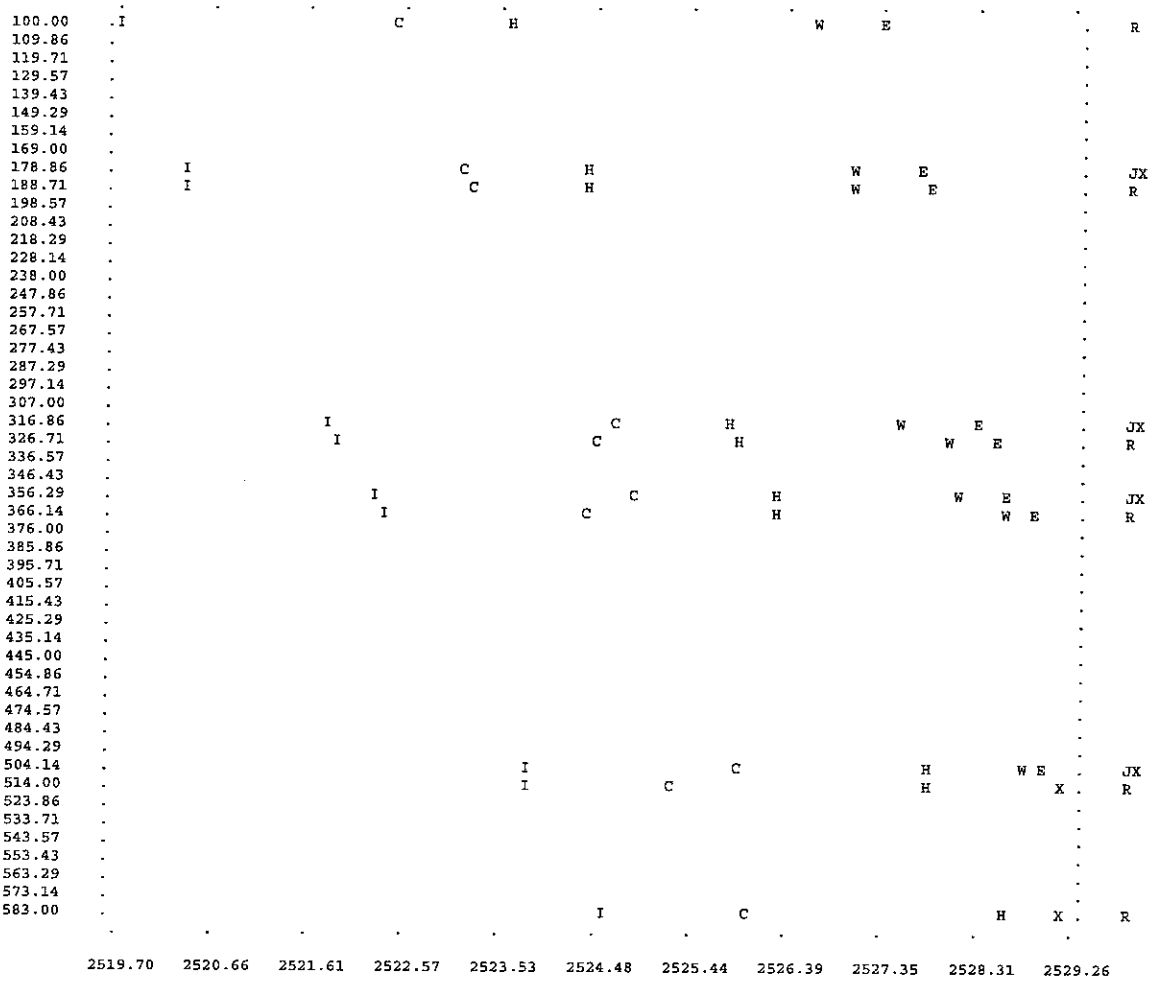
LICENSEE: STANLEY CONSULTANTS, INC. F0515P PAGE 1

WATER SURFACE PROFILE LISTING

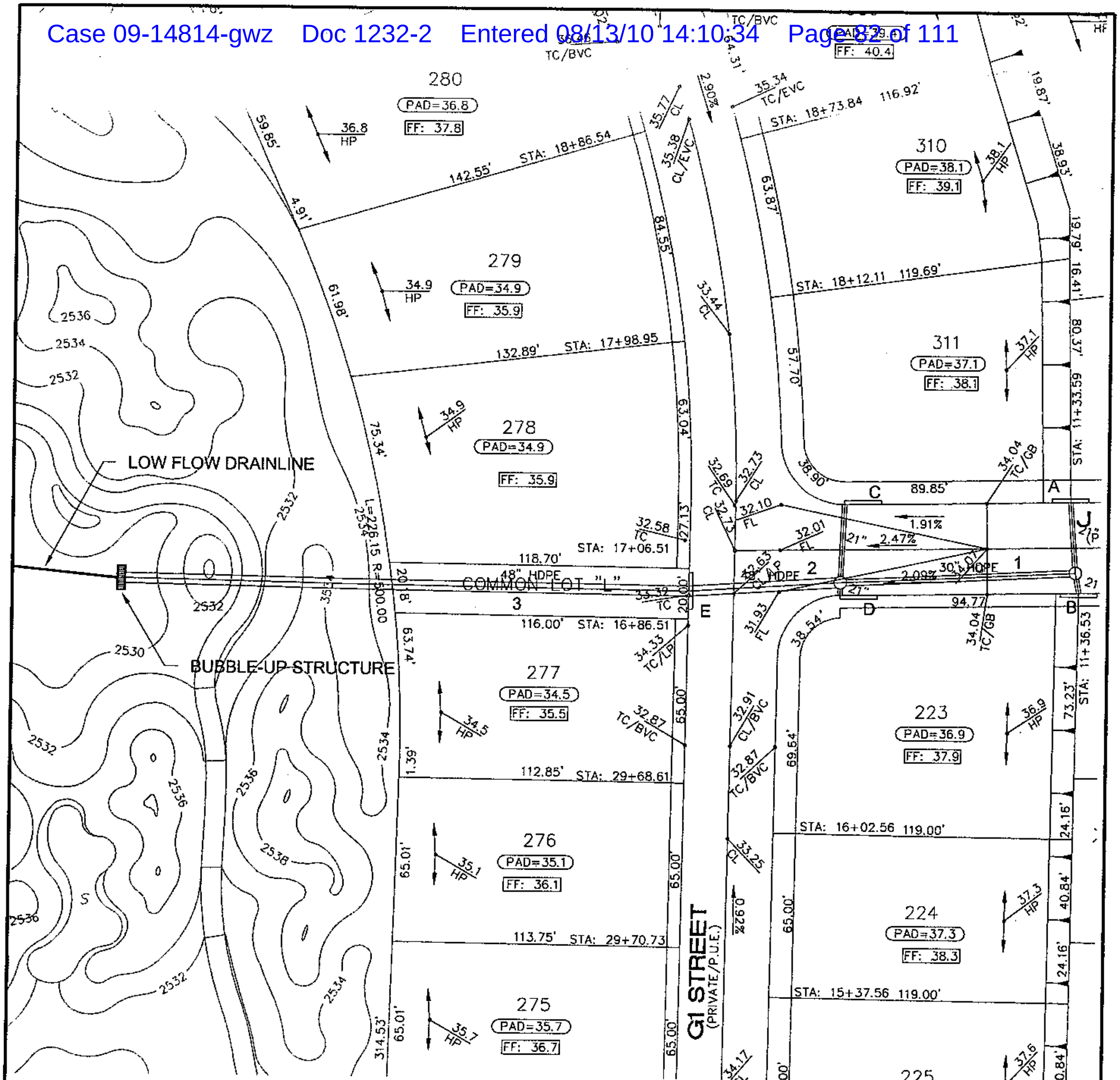
GOLDEN VALLEY RANCH
GOLDEN VALLEY
STORM DRAIN IN POD 2 G2 STREET FOR 103 CFS

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	2519.70	7.000	2526.700	87.0	6.92	0.744	2527.444	0.00	2.828		4.00	0.00	0.00	0	0.00
70.00	0.01000					.003668	0.26			2.246			0.00		
170.00	2520.40	6.680	2527.080	87.0	6.92	0.744	2527.824	0.00	2.828		4.00	0.00	0.00	0	0.00
JUNCT STR	0.01000					.003668	0.02						0.00		
175.00	2520.45	6.648	2527.098	87.0	6.92	0.744	2527.842	0.00	2.828		4.00	0.00	0.00	0	0.00
133.00	0.01075					.003668	0.49			2.196			0.00		
308.00	2521.88	5.706	2527.586	87.0	6.92	0.744	2528.330	0.00	2.828		4.00	0.00	0.00	0	0.00
JUNCT STR	0.01000					.003090	0.02						0.00		
313.00	2521.93	6.140	2528.070	72.0	5.73	0.510	2528.580	0.00	2.566		4.00	0.00	0.00	0	0.00
40.00	0.01000					.002512	0.10			2.002			0.00		
353.00	2522.33	5.841	2528.171	72.0	5.73	0.510	2528.681	0.00	2.566		4.00	0.00	0.00	0	0.00
JUNCT STR	0.01000					.001838	0.01						0.00		
358.00	2522.38	6.267	2528.647	49.0	3.90	0.236	2528.883	0.00	2.099		4.00	0.00	0.00	0	0.00
145.00	0.01000					.001164	0.17			1.610			0.00		
503.00	2523.83	4.986	2528.816	49.0	3.90	0.236	2529.052	0.00	2.099		4.00	0.00	0.00	0	0.00
JUNCT STR	0.01000					.000700	0.00						0.00		
508.00	2523.88	5.316	2529.196	22.0	1.75	0.048	2529.244	0.00	1.383		4.00	0.00	0.00	0	0.00
75.00	0.01000					.000235	0.02			1.057			0.00		
583.00	2524.63	4.584	2529.214	22.0	1.75	0.048	2529.262	0.00	1.383		4.00	0.00	0.00	0	0.00

GOLDEN VALLEY RANCH
GOLDEN VALLEY
STORM DRAIN IN POD 2 G2 STREET FOR 103 CFS



N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY



STORM DRAIN SYSTEM					
INLET	SIZE	Qinlet	Qintercept	Qbypass	Grade/Sump
A	14.5	54	18	36	G
B	14.5	54	18	36	G
C	14.5	36	14	22	G
D	8.5	36	14	22	G
E	11.5	72	12	60	S

SD PIPES		
PIPE	Qpipe	Size
1	36	A
2	64	B
3	76	C

BUBBLE-UP STR		
PIPE	Type	Open Area
48	Type 8	10 X 3.5

REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RJM
CHECKED
APPROVED
APPROVED
DATE 3/02/06

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 2 - PHASE B

COMMON LOT L
NODE J-S20

SCALE 1" = 60'
NO. A
REV. 0

$$$$$$$$$FILENAME$$$$$$$$$

CADD A1-R3

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod 2
Project Name.:Golden Valley Ranch
Computed by :rjm

Project Description

COMMON EASEMENT L
NODE J-S20
INLET A

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope		Composite
S	Longitudinal Slope	(ft/ft)	0.0247
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		54.000
T	Width of Spread (ft)		27.01

Gutter Flow

Eo	Gutter Flow Ratio	0.160
d	Depth of Flow (ft)	0.64
V	Average Velocity (ft/sec)	7.33

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	78.13	7.25	0.03	1.692	52.308
Parallel Bar P-1-7/8	1.50	5.88	0.31	16.398	35.910
Combination			0.33	18.090	35.910

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod 2
Project Name.:Golden Valley Ranch
Computed by :rjm

Project Description

COMMON EASEMENT L
NODE J-S20
INLET B

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope		Composite
S	Longitudinal Slope	(ft/ft)	0.0247
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		54.000
T	Width of Spread (ft)		27.01

Gutter Flow

Eo	Gutter Flow Ratio	0.160
d	Depth of Flow (ft)	0.64
V	Average Velocity (ft/sec)	7.33

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	78.13	7.25	0.03	1.692	52.308
Parallel Bar P-1-7/8	1.50	5.88	0.31	16.398	35.910
Combination			0.33	18.090	35.910

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod 2
Project Name.:Golden Valley Ranch
Computed by :rjm

Project Description

COMMON EASEMENT L
NODE J-S20
INLET C

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope		Composite
S	Longitudinal Slope	(ft/ft)	0.0197
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		34.000
T	Width of Spread (ft)		23.56

Gutter Flow

Eo	Gutter Flow Ratio	0.185
d	Depth of Flow (ft)	0.57
V	Average Velocity (ft/sec)	6.05

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	57.08	7.25	0.04	1.455	32.545
Parallel Bar P-1-7/8	1.50	5.88	0.38	12.427	20.118
Combination			0.41	13.882	20.118

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod 2
Project Name.:Golden Valley Ranch
Computed by :rjm

Project Description

COMMON EASEMENT L
NODE J-S20
INLET D

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope		Composite
S	Longitudinal Slope	(ft/ft)	0.0209
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		34.000
T	Width of Spread (ft)		23.30

Gutter Flow

Eo	Gutter Flow Ratio	0.187
d	Depth of Flow (ft)	0.56
V	Average Velocity (ft/sec)	6.18

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	57.84	7.25	0.04	1.436	32.564
Parallel Bar P-1-7/8	1.50	5.88	0.38	12.297	20.267
Combination			0.40	13.733	20.267

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Sag
Date: 03/10/2006

Project No. :18449
Project Name.:GOLDEN VALLEY RANCH
Computed by :rjm

Project Description
SAG INLETS - ALL PODS
MODIFIED "C" L-14.5
POOL J-520 INLET E
Inlets on Sag: Sweeper Combination Inlet

Roadway and Discharge Data

	Cross Slope	Composite/Dep
Sx	Pavement Cross Slope (ft/ft)	0.0100
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00

Inlet Interception

	Inlet Type *Sag*	Curb-Opening
L	Curb-Opening Length (ft)	5.75
H	Curb-Opening Height (in)	6.00
	Inlet Type *Sag*	Parallel Bar P-1-7/8
T	Width of Spread (ft)	39.39
WGR	Grate Width (ft)	1.50
L	Grate Length (ft)	5.88
	Inlet Type *Sag*	Sweeper Combination
d_ave	Depth of Flow (ft)	0.525
d_curb	Depth at Curb (ft)	0.671
Qi	Intercepted Flow (cfs)	12.000

Note: The curb opening length in the input screen is the total of the curb opening including its length along the grate.

Worksheet

Worksheet for Triangular Channel

Project Description	
Worksheet	COMMON LOT L - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.020	
Channel Slope	0.005000	ft/ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	60.00	cfs

Results		
Depth	0.84	ft
Flow Area	20.4	ft²
Wetted Perimeter	48.46	ft
Top Width	48.43	ft
Critical Depth	0.77	ft
Critical Slope	0.008018	ft/ft
Velocity	2.95	ft/s
Velocity Head	0.13	ft
Specific Energy	0.98	ft
Froude Number	0.80	
Flow Type	Subcritical	

VELOCITY x DEPTH

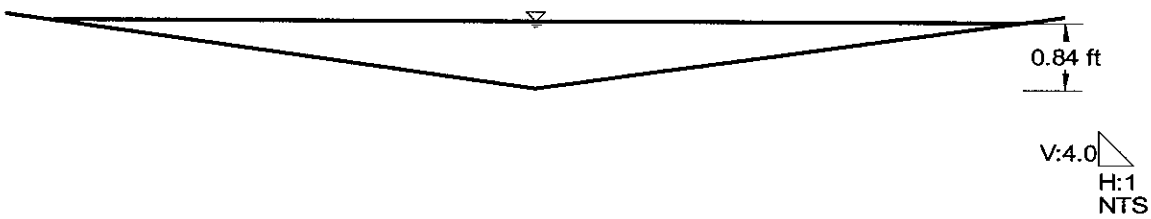
3.0 x 0.8 = 2.4 < 6.0

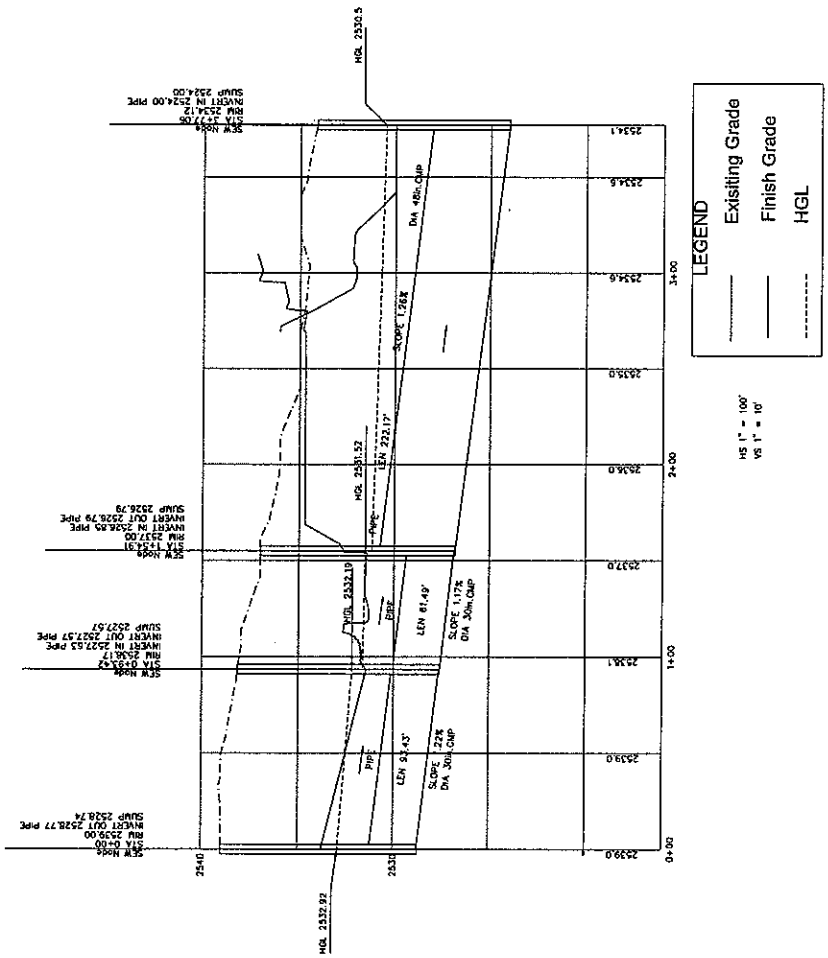
Cross Section

Cross Section for Triangular Channel

Project Description	
Worksheet	COMMON LOT L - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.020	
Channel Slope	0.005000	ft/ft
Depth	0.84	ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	60.00	cfs





REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RN
CHECKED
APPROVED
APPROVED
DATE DATE

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
PROJECT_LOCATION

COMMON LOT L
NODE J-S20

SCALE 1:1

NO.	REV.
A	0

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CADD A1-R3 © STANLEY CONSULTANTS

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

LATERAL WITH FLOW 36CFS JS20 AT POD2 J - G1 STR

DATE: 3/15/2006
TIME: 14:49

F0515P

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	48	4			4.00														
CD	30	4			2.50														
CD	18	4			1.50														
CD	21	4			1.75														

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	100.00	2524.00	48	2530.50

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	345.00	2526.79	48	0.013	0.00	0.00	0.00	0

ELEMENT NO 3 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	345.00	2526.85	48	18	0	0.013	12.0	0.0	2526.85	0.00	90.00	0.00

ELEMENT NO 4 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	405.00	2527.57	48	0.013	0.00	0.00	0.00	0

ELEMENT NO 5 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	405.00	2527.63	48	21	21	0.013	14.0	14.0	2527.63	2527.63	90.00	90.00

WARNING - ADJACENT SECTIONS ARE NOT IDENTICAL - SEE SECTION NUMBERS AND CHANNEL DEFINITIONS

ELEMENT NO 6 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	500.00	2528.77	30	0.013	0.00	0.00	0.00	0

ELEMENT NO 7 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	500.00	2528.77	30	0.00

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC

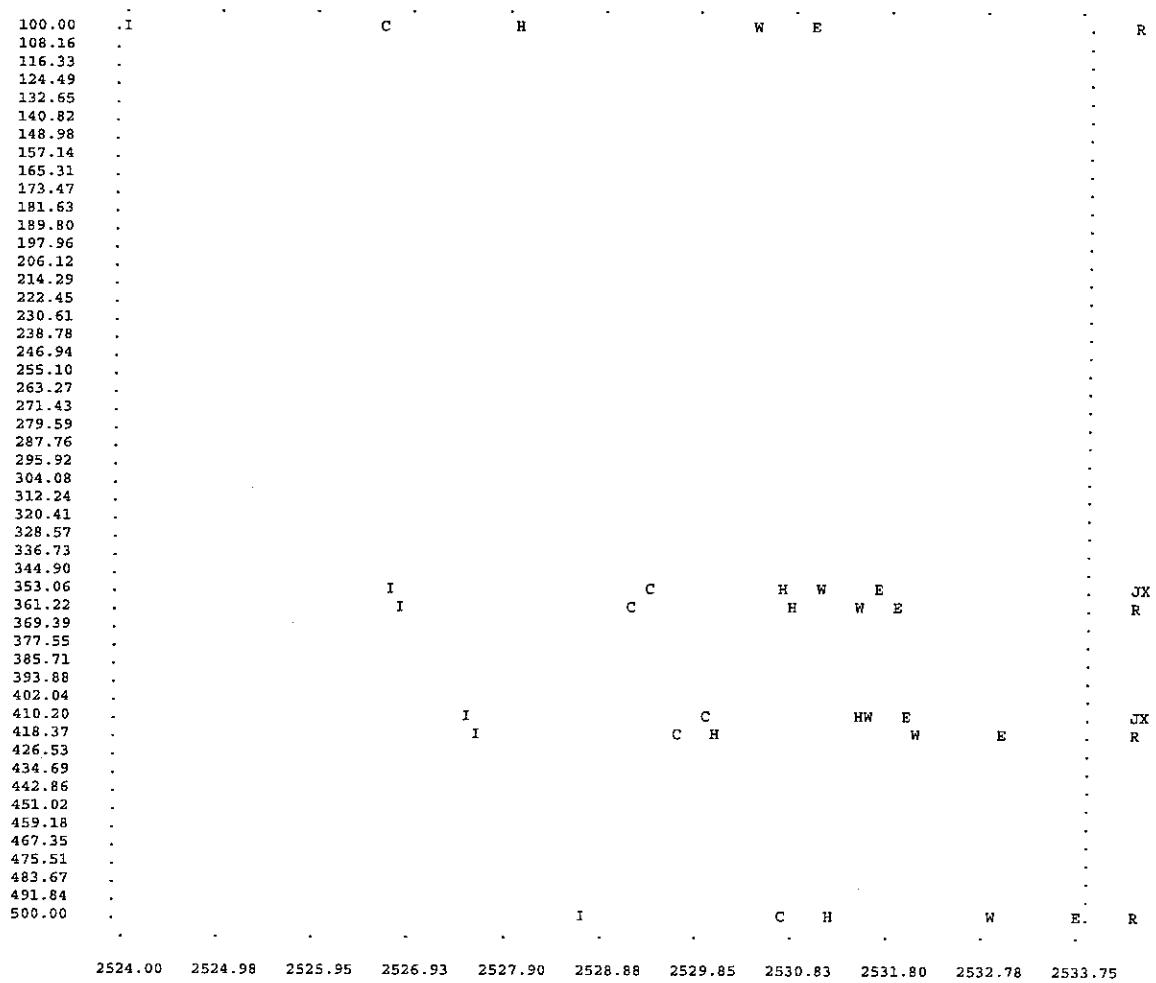
LICENSEE: STANLEY CONSULTANTS, INC. F0515P PAGE 1

WATER SURFACE PROFILE LISTING

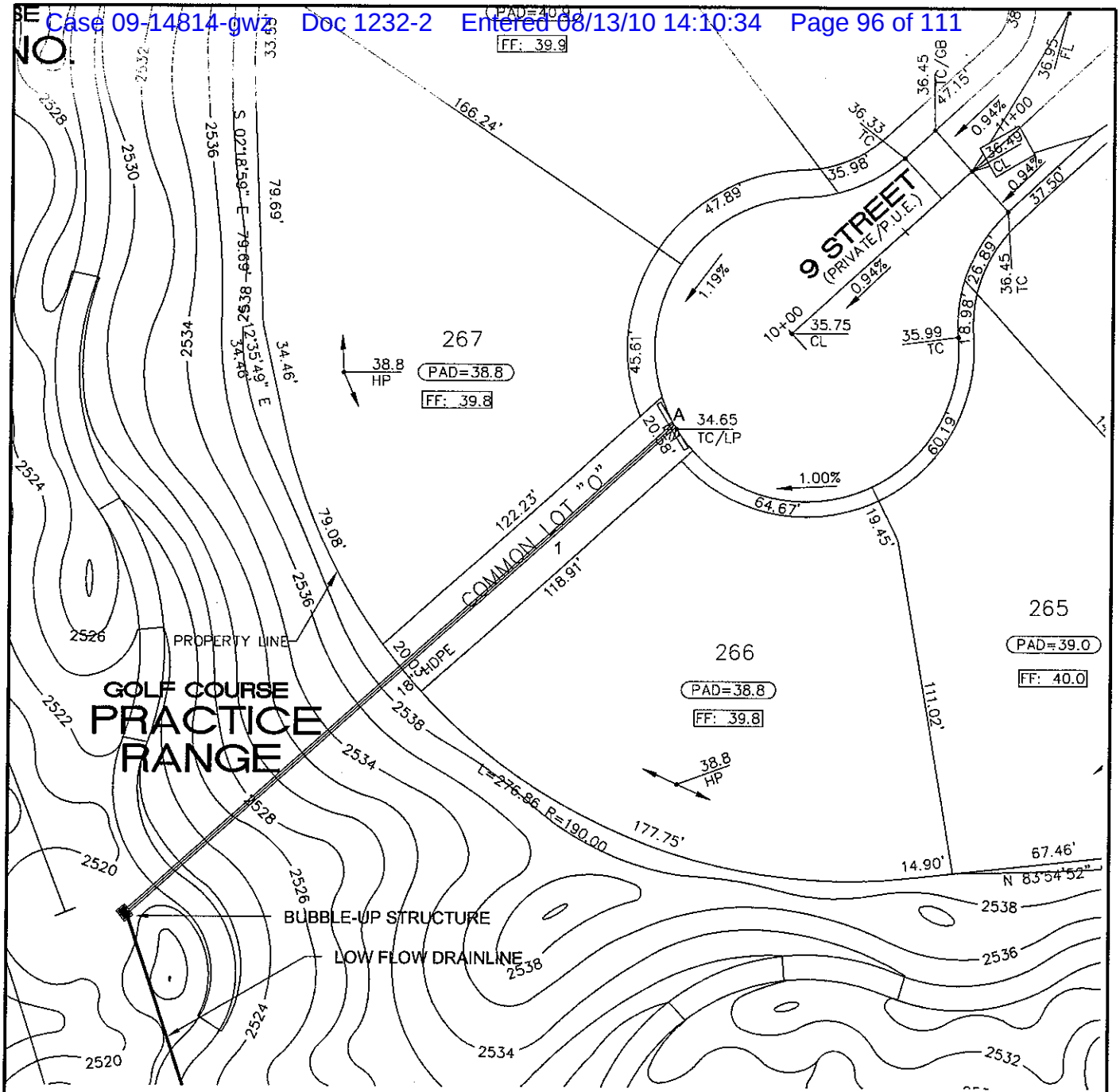
GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL WITH FLOW 35CFS J-C21

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	2524.00	6.500	2530.500	76.0	6.05	0.568	2531.068	0.00	2.639		4.00	0.00	0.00	0	0.00
245.00	0.01139					.002799	0.69			1.990			0.00		
345.00	2526.79	4.396	2531.186	76.0	6.05	0.568	2531.754	0.00	2.639		4.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.002392	0.00						0.00		
345.00	2526.85	4.666	2531.516	64.0	5.09	0.403	2531.919	0.00	2.414		4.00	0.00	0.00	0	0.00
60.00	0.01200					.001985	0.12			1.775			0.00		
405.00	2527.57	4.065	2531.635	64.0	5.09	0.403	2532.038	0.00	2.414		4.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.001306	0.00						0.00		
405.00	2527.63	4.556	2532.186	36.0	7.33	0.835	2533.021	0.00	2.035		2.50	0.00	0.00	0	0.00
95.00	0.01200					.007703	0.73			1.692			0.00		
500.00	2528.77	4.148	2532.918	36.0	7.33	0.835	2533.753	0.00	2.035		2.50	0.00	0.00	0	0.00

GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL WITH FLOW 35CFS J-C21



N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY



STORM DRAIN SYSTEM					
INLET	SIZE	Qinlet	Qintercept	Qbypass	Grade/Sump
A	17.5	51	15	36	S

SD PIPES		
PIPE	Qpipe	Size
1	15	A

BUBBLE-UP STR	
PIPE	Type Open Area
18	Type F 2.5 x 3.5

REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RJM
CHECKED
APPROVED
APPROVED
DATE 3/02/06

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 2 – PHASE B

COMMON LOT O
SHED P2-67

SCALE 1" = 50'

NO. A

REV. 0

$$$$FILENAME$$$$

CADD A1-R3

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Sag
Date: 03/10/2006

Project No. :18449
Project Name.:GOLDEN VALLEY RANCH
Computed by :rjm

Project Description
SAG INLETS - ALL PODS
MODIFIED "C" L-17.5
SHEET P2-67 INLET A Common Lot "O"
Inlets on Sag: Sweeper Combination Inlet

Roadway and Discharge Data

		Composite/Dep
	Cross Slope	
Sx	Pavement Cross Slope (ft/ft)	0.0100
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00

Inlet Interception

		Curb-Opening
	Inlet Type *Sag*	
L	Curb-Opening Length (ft)	8.75
H	Curb-Opening Height (in)	6.00
	Inlet Type *Sag*	Parallel Bar P-1-7/8
T	Width of Spread (ft)	39.00
WGR	Grate Width (ft)	1.50
L	Grate Length (ft)	7.38
	Inlet Type *Sag*	Sweeper Combination
d_ave	Depth of Flow (ft)	0.521
d_curb	Depth at Curb (ft)	0.667
Qi	Intercepted Flow (cfs)	15.000

Note: The curb opening length in the input screen is the total of the curb opening including its length along the grate.

Worksheet

Worksheet for Triangular Channel

Project Description	
Worksheet	COMMON LOT 0 - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.020	
Channel Slope	0.005000	ft/ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	36.00	cfs

Results		
Depth	0.69	ft
Flow Area	13.9	ft²
Wetted Perimeter	40.01	ft
Top Width	39.99	ft
Critical Depth	0.63	ft
Critical Slope	0.008577	ft/ft
Velocity	2.59	ft/s
Velocity Head	0.10	ft
Specific Energy	0.80	ft
Froude Number	0.78	
Flow Type	Subcritical	

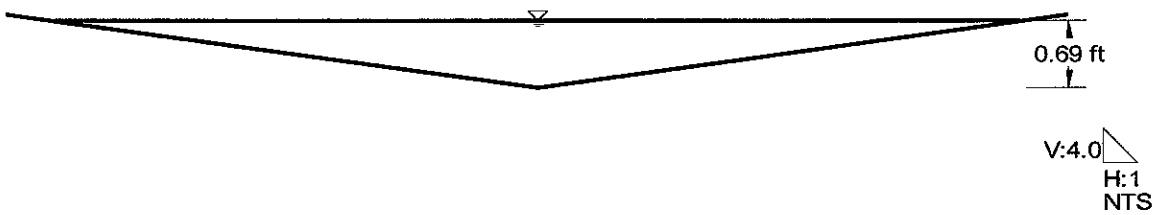
VELOCITY x DEPTH

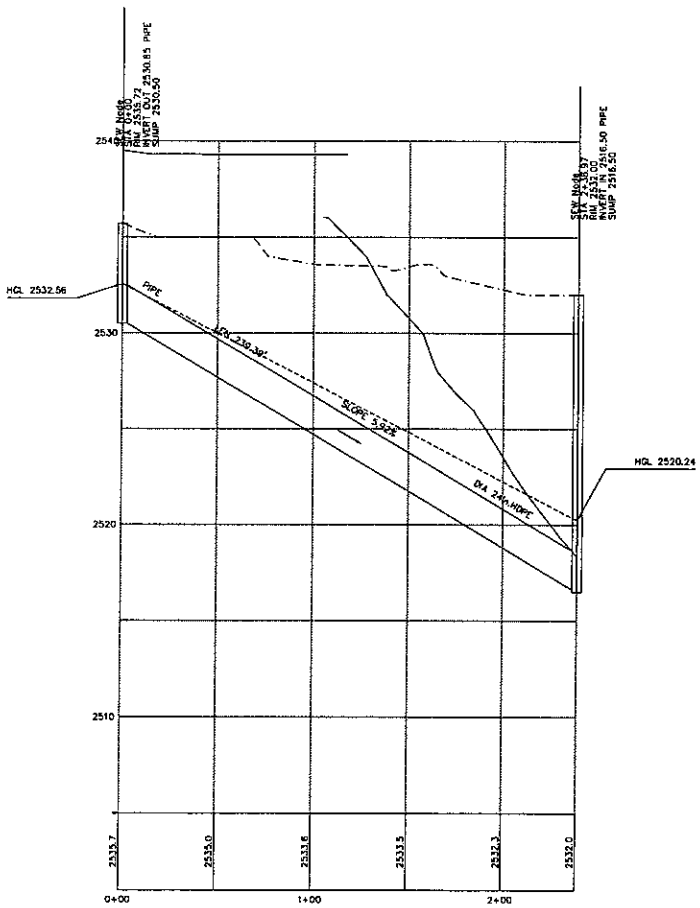
2.6 x 0.7 = 1.8 < 6.0

Cross Section
Cross Section for Triangular Channel

Project Description	
Worksheet	COMMON LOT 0 - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.020	
Channel Slope	0.005000	ft/ft
Depth	0.69	ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	36.00	cfs





REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RN
CHECKED
APPROVED
APPROVED
DATE DATE

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 2 - PHASE B

COMMON LOT O
SHED P2-67

SCALE

NO. A

REV. 0

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$$$$$$$$$$FILENAME$$$$$$$$$$

CADD A1-R3 © STANLEY CONSULTANTS

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

LATERAL IN POD 2 P2-67 FLOW - 32CFS 9 STR AND G1 STR

DATE: 3/10/2006
TIME: 10: 5

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	18	4			2.00														

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	100.00	2516.50	18	2521.00

ELEMENT NO 2 IS A REACH * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	350.00	2530.65	18	0.013	0.00	0.00	0.00	0

ELEMENT NO 3 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	350.00	2530.65	18	0.00

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC

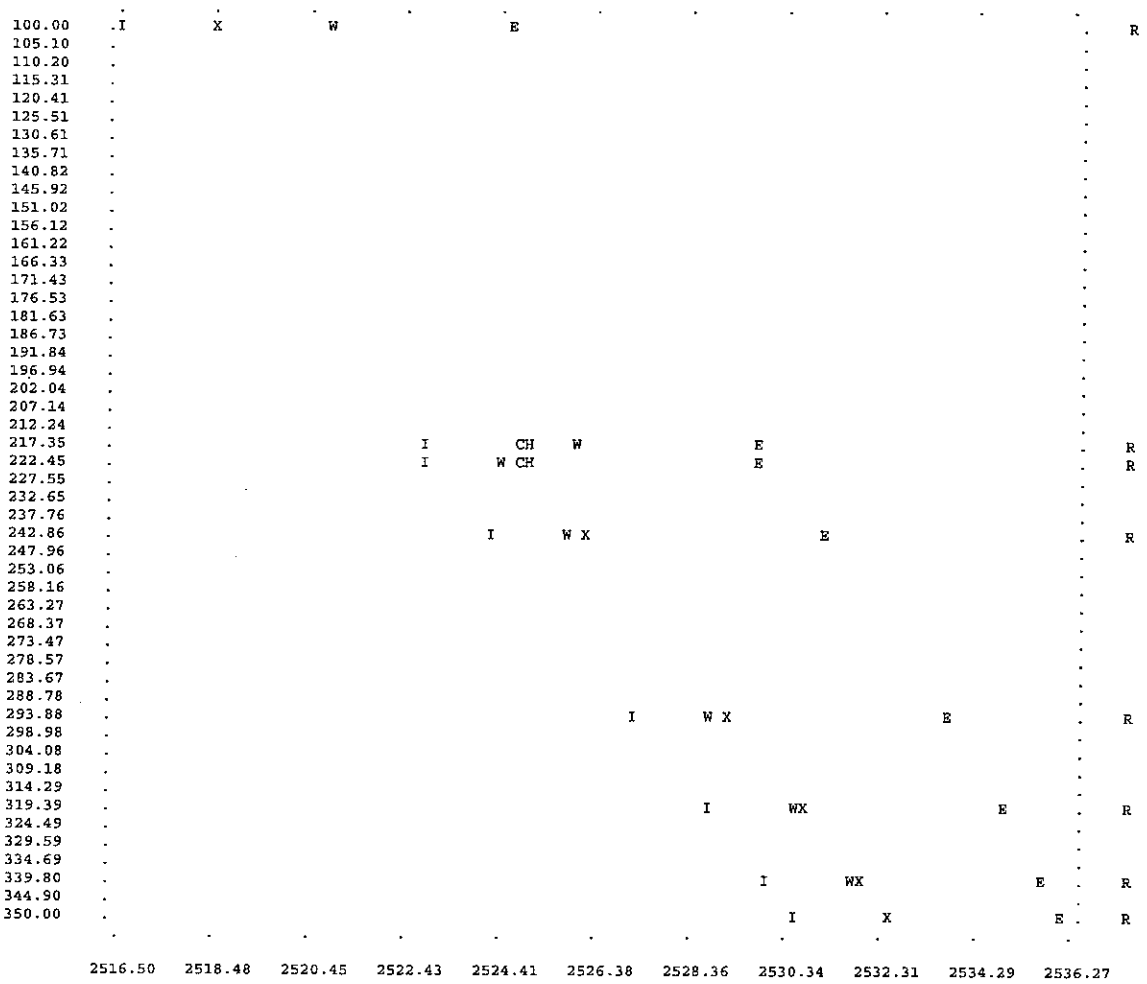
LICENSEE: STANLEY CONSULTANTS, INC. F0515P PAGE 1

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL IN POD 2 P2-67 FLOW - 32CFS 9 STR AND G1 STR

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	2516.50	4.500	2521.000	48.0	15.28	3.624	2524.624	0.00	1.977		2.00	0.00	0.00	0	0.00
114.81	0.05660					.045020	5.17			1.470			0.00		
214.81	2523.00	3.175	2526.173	48.0	15.28	3.624	2529.797	0.00	1.977		2.00	0.00	0.00	0	0.00
HYDRAULIC JUMP													0.00		
214.81	2523.00	1.525	2524.523	48.0	18.68	5.417	2529.940	0.00	1.977		2.00	0.00	0.00	0	0.00
23.89	0.05660					.051681	1.23			1.470			0.00		
238.70	2524.35	1.536	2525.886	48.0	18.53	5.329	2531.215	0.00	1.977		2.00	0.00	0.00	0	0.00
51.86	0.05660					.048759	2.53			1.470			0.00		
290.56	2527.29	1.614	2528.900	48.0	17.67	4.846	2533.746	0.00	1.977		2.00	0.00	0.00	0	0.00
28.67	0.05660					.044302	1.27			1.470			0.00		
319.23	2528.91	1.702	2530.610	48.0	16.84	4.405	2535.015	0.00	1.977		2.00	0.00	0.00	0	0.00
18.72	0.05660					.040872	0.77			1.470			0.00		
337.95	2529.97	1.808	2531.776	48.0	16.06	4.004	2535.780	0.00	1.977		2.00	0.00	0.00	0	0.00
12.05	0.05660					.040349	0.49			1.470			0.00		
350.00	2530.65	1.977	2532.627	48.0	15.31	3.640	2536.267	0.00	1.977		2.00	0.00	0.00	0	0.00

GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL IN POD 2 P2-67 FLOW - 32CFS 9 STR AND G1 STR



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2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

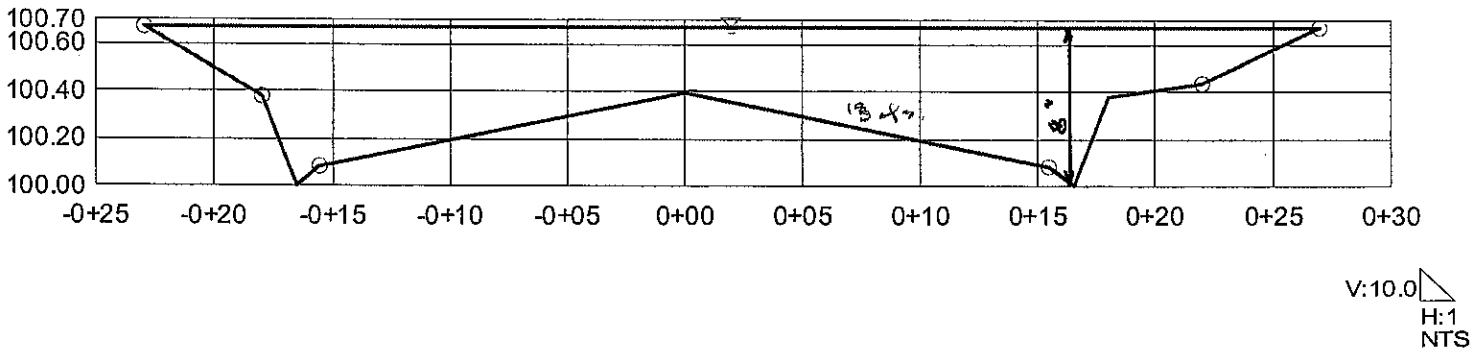
APPENDIX C

STREET CAPACITY (LOCAL STREETS)

Cross Section
Cross Section for Irregular Channel

Project Description	
Worksheet	Local Str 50'Pl
Flow Element	Irregular Chan
Method	Manning's For
Solve For	Discharge

Section Data		
Mannings Coefficie	0.014	
Channel Slope	0.005000	ft/ft
Water Surface Elev	100.67	ft
Elevation Range	0.00 to 100.67	
Discharge	68.88	cfs



Table

Rating Table for Irregular Channel

Project Description	
Worksheet	Local Str 50'PL
Flow Element	Irregular Chan
Method	Manning's For
Solve For	Discharge

Input Data	
Water Surface Elev.	00.67 ft

Options	
Current Roughness Meth	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weightin	Horton's Method

Attribute	Minimum	Maximum	Increment
Channel Slope (ft/ft)	0.005000	0.020000	0.000100

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.005000	68.88	3.73	18.5	50.12	50.00
0.005100	69.57	3.76	18.5	50.12	50.00
0.005200	70.25	3.80	18.5	50.12	50.00
0.005300	70.92	3.84	18.5	50.12	50.00
0.005400	71.59	3.87	18.5	50.12	50.00
0.005500	72.25	3.91	18.5	50.12	50.00
0.005600	72.90	3.94	18.5	50.12	50.00
0.005700	73.55	3.98	18.5	50.12	50.00
0.005800	74.19	4.01	18.5	50.12	50.00
0.005900	74.83	4.05	18.5	50.12	50.00
0.006000	75.46	4.08	18.5	50.12	50.00
0.006100	76.09	4.12	18.5	50.12	50.00
0.006200	76.71	4.15	18.5	50.12	50.00
0.006300	77.32	4.18	18.5	50.12	50.00
0.006400	77.93	4.22	18.5	50.12	50.00
0.006500	78.54	4.25	18.5	50.12	50.00
0.006600	79.14	4.28	18.5	50.12	50.00
0.006700	79.74	4.31	18.5	50.12	50.00
0.006800	80.33	4.35	18.5	50.12	50.00
0.006900	80.92	4.38	18.5	50.12	50.00
0.007000	81.51	4.41	18.5	50.12	50.00
0.007100	82.09	4.44	18.5	50.12	50.00
0.007200	82.66	4.47	18.5	50.12	50.00
0.007300	83.23	4.50	18.5	50.12	50.00
0.007400	83.80	4.53	18.5	50.12	50.00
0.007500	84.37	4.56	18.5	50.12	50.00
0.007600	84.93	4.60	18.5	50.12	50.00
0.007700	85.48	4.63	18.5	50.12	50.00
0.007800	86.04	4.66	18.5	50.12	50.00
0.007900	86.59	4.69	18.5	50.12	50.00
0.008000	87.13	4.71	18.5	50.12	50.00
0.008100	87.68	4.74	18.5	50.12	50.00
0.008200	88.22	4.77	18.5	50.12	50.00
0.008300	88.75	4.80	18.5	50.12	50.00

Table

Rating Table for Irregular Channel

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.008400	89.28	4.83	18.5	50.12	50.00
0.008500	89.81	4.86	18.5	50.12	50.00
0.008600	90.34	4.89	18.5	50.12	50.00
0.008700	90.87	4.92	18.5	50.12	50.00
0.008800	91.39	4.94	18.5	50.12	50.00
0.008900	91.90	4.97	18.5	50.12	50.00
0.009000	92.42	5.00	18.5	50.12	50.00
0.009100	92.93	5.03	18.5	50.12	50.00
0.009200	93.44	5.06	18.5	50.12	50.00
0.009300	93.95	5.08	18.5	50.12	50.00
0.009400	94.45	5.11	18.5	50.12	50.00
0.009500	94.95	5.14	18.5	50.12	50.00
0.009600	95.45	5.16	18.5	50.12	50.00
0.009700	95.95	5.19	18.5	50.12	50.00
0.009800	96.44	5.22	18.5	50.12	50.00
0.009900	96.93	5.24	18.5	50.12	50.00
0.010000	97.42	5.27	18.5	50.12	50.00
0.010100	97.90	5.30	18.5	50.12	50.00
0.010200	98.39	5.32	18.5	50.12	50.00
0.010300	98.87	5.35	18.5	50.12	50.00
0.010400	99.35	5.38	18.5	50.12	50.00
0.010500	99.82	5.40	18.5	50.12	50.00
0.010600	100.30	5.43	18.5	50.12	50.00
0.010700	100.77	5.45	18.5	50.12	50.00
0.010800	101.24	5.48	18.5	50.12	50.00
0.010900	101.71	5.50	18.5	50.12	50.00
0.011000	102.17	5.53	18.5	50.12	50.00
0.011100	102.64	5.55	18.5	50.12	50.00
0.011200	103.10	5.58	18.5	50.12	50.00
0.011300	103.56	5.60	18.5	50.12	50.00
0.011400	104.01	5.63	18.5	50.12	50.00
0.011500	104.47	5.65	18.5	50.12	50.00
0.011600	104.92	5.68	18.5	50.12	50.00
0.011700	105.37	5.70	18.5	50.12	50.00
0.011800	105.82	5.73	18.5	50.12	50.00
0.011900	106.27	5.75	18.5	50.12	50.00
0.012000	106.72	5.77	18.5	50.12	50.00
0.012100	107.16	5.80	18.5	50.12	50.00
0.012200	107.60	5.82	18.5	50.12	50.00
0.012300	108.04	5.85	18.5	50.12	50.00
0.012400	108.48	5.87	18.5	50.12	50.00
0.012500	108.92	5.89	18.5	50.12	50.00
0.012600	109.35	5.92	18.5	50.12	50.00
0.012700	109.78	5.94	18.5	50.12	50.00
0.012800	110.22	5.96	18.5	50.12	50.00
0.012900	110.65	5.99	18.5	50.12	50.00
0.013000	111.07	6.01	18.5	50.12	50.00
0.013100	111.50	6.03	18.5	50.12	50.00
0.013200	111.92	6.06	18.5	50.12	50.00
0.013300	112.35	6.08	18.5	50.12	50.00
0.013400	112.77	6.10	18.5	50.12	50.00
0.013500	113.19	6.12	18.5	50.12	50.00
0.013600	113.61	6.15	18.5	50.12	50.00

Table

Rating Table for Irregular Channel

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.013700	114.02	6.17	18.5	50.12	50.00
0.013800	114.44	6.19	18.5	50.12	50.00
0.013900	114.85	6.21	18.5	50.12	50.00
0.014000	115.27	6.24	18.5	50.12	50.00
0.014100	115.68	6.26	18.5	50.12	50.00
0.014200	116.09	6.28	18.5	50.12	50.00
0.014300	116.49	6.30	18.5	50.12	50.00
0.014400	116.90	6.33	18.5	50.12	50.00
0.014500	117.31	6.35	18.5	50.12	50.00
0.014600	117.71	6.37	18.5	50.12	50.00
0.014700	118.11	6.39	18.5	50.12	50.00
0.014800	118.51	6.41	18.5	50.12	50.00
0.014900	118.91	6.43	18.5	50.12	50.00
0.015000	119.31	6.46	18.5	50.12	50.00
0.015100	119.71	6.48	18.5	50.12	50.00
0.015200	120.10	6.50	18.5	50.12	50.00
0.015300	120.50	6.52	18.5	50.12	50.00
0.015400	120.89	6.54	18.5	50.12	50.00
0.015500	121.28	6.56	18.5	50.12	50.00
0.015600	121.67	6.58	18.5	50.12	50.00
0.015700	122.06	6.60	18.5	50.12	50.00
0.015800	122.45	6.63	18.5	50.12	50.00
0.015900	122.84	6.65	18.5	50.12	50.00
0.016000	123.22	6.67	18.5	50.12	50.00
0.016100	123.61	6.69	18.5	50.12	50.00
0.016200	123.99	6.71	18.5	50.12	50.00
0.016300	124.37	6.73	18.5	50.12	50.00
0.016400	124.76	6.75	18.5	50.12	50.00
0.016500	125.14	6.77	18.5	50.12	50.00
0.016600	125.51	6.79	18.5	50.12	50.00
0.016700	125.89	6.81	18.5	50.12	50.00
0.016800	126.27	6.83	18.5	50.12	50.00
0.016900	126.64	6.85	18.5	50.12	50.00
0.017000	127.02	6.87	18.5	50.12	50.00
0.017100	127.39	6.89	18.5	50.12	50.00
0.017200	127.76	6.91	18.5	50.12	50.00
0.017300	128.13	6.93	18.5	50.12	50.00
0.017400	128.50	6.95	18.5	50.12	50.00
0.017500	128.87	6.97	18.5	50.12	50.00
0.017600	129.24	6.99	18.5	50.12	50.00
0.017700	129.61	7.01	18.5	50.12	50.00
0.017800	129.97	7.03	18.5	50.12	50.00
0.017900	130.34	7.05	18.5	50.12	50.00
0.018000	130.70	7.07	18.5	50.12	50.00
0.018100	131.06	7.09	18.5	50.12	50.00
0.018200	131.42	7.11	18.5	50.12	50.00
0.018300	131.78	7.13	18.5	50.12	50.00
0.018400	132.14	7.15	18.5	50.12	50.00
0.018500	132.50	7.17	18.5	50.12	50.00
0.018600	132.86	7.19	18.5	50.12	50.00
0.018700	133.22	7.21	18.5	50.12	50.00
0.018800	133.57	7.23	18.5	50.12	50.00
0.018900	133.93	7.25	18.5	50.12	50.00

Table

Rating Table for Irregular Channel

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.019000	134.28	7.27	18.5	50.12	50.00
0.019100	134.63	7.28	18.5	50.12	50.00
0.019200	134.99	7.30	18.5	50.12	50.00
0.019300	135.34	7.32	18.5	50.12	50.00
0.019400	135.69	7.34	18.5	50.12	50.00
0.019500	136.04	7.36	18.5	50.12	50.00
0.019600	136.38	7.38	18.5	50.12	50.00
0.019700	136.73	7.40	18.5	50.12	50.00
0.019800	137.08	7.42	18.5	50.12	50.00
0.019900	137.42	7.44	18.5	50.12	50.00
0.020000	137.77	7.45	18.5	50.12	50.00